The Bristol Medico-Chirurgical Journal

"Scire est nescire, nisi id me Scire alius sciret."

WINTER, 1932.

THE LONG FOX MEMORIAL LECTURE:

DELIVERED IN THE UNIVERSITY OF BRISTOL ON OCTOBER 25TH, 1932.

THE VICE-CHANCELLOR (Dr. T. LOVEDAY, M.A., LL.D) *in the Chair.*

BY

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ON

THE PROBLEM OF DEAFNESS.

I FEEL deeply the honour which has been conferred upon me in inviting me to give this lecture. The late Dr. Long Fox would, however, I am sure, have welcomed the appointment of a laryngologist, since both his son-in-law and grandson have made such valuable contributions to this branch of medical science. The subject selected is one which has a very wide appeal. Deafness is a terrible affliction, and one which leads to more human misery than even

blindness. The old saying that there are only two classes of deafness, those which can be cured with the syringe and those which cannot be cured at all, embodies a reproach to the otologist which would on superficial examination seem to be justified. My intention this afternoon is to try to demonstrate that some advance has been made, and that there is hope for further progress in the future.

Before considering the problem of the deaf we must briefly consider the normal mechanism of hearing. The faculty of hearing is the most recent addition to the special senses, and I believe it is this fact that renders the organ of hearing particularly liable to degeneration and disease. We all, I think, appreciate this, although perhaps sub-consciously, in that we expect the aged to develop a nerve deafness, while we do not, however, expect them to develop a degeneration of the nervous mechanism of vision. Also, as in some families greyness of the hair occurs at an early age, so in others does, I believe, a premature ageing of the auditory apparatus take place. We also all recognize the sensitiveness of the auditory nerve mechanism to injury, in that we expect a dose of quinine, an overdose of alcohol or a loud sound to give us a sensation of buzzing in the ears. It will, I think, render the appreciation of how we hear more easy if we briefly review the development of hearing as we see it presented in the lower orders.*

The lowest form of life in which the faculty of hearing, though of a very low order, has been recently identified is in some species of fish. (Fig. 1.) In them the primitive sense of hearing is centred in the otolith

* I am indebted for the detail of the evolution of the ear and for Figs. 2—5 to R. T. Beatty, *Discussion on Audition* — Physical Society, 1931.

organs, the primary function of which is the indication of position, with hearing added at a later stage as a secondary function. These otolith organs consist essentially of a grouping of nerve cells with hair-like processes, on which are placed granules of calcium carbonate. These hair cells are connected by nerves with the central nervous system. During changes of position variations in pressure effects are produced on the hair cells and by them conveyed to the brain. As far as hearing is concerned the organ is a primitive one, the hair cells being directly stimulated by the sound vibrations, but obviously such an apparatus does not permit of any analysis of sound, *i.e.* there is no tone perception.

As we ascend the scale we find in amphibians (Fig. 2) the development of new groups of sensory cells designed to serve the auditory function alone, that is, we have the development of an internal ear or cochlea. In addition, we find the appearance of a tympanic membrane let into the surface of the skull and connected by a bony shaft, the columella, to a membraneous window in the wall of the cochlea. Thus, we have both an apparatus for receiving and for perceiving the sound waves. In birds and reptiles (Fig. 3) we find for the first time an arrangement in the cochlea designed for the differentiation of pitch, similar in nature to that met with in man. This consists in an orderly arrangement of nerve cells placed upon a vibrating membrane instead of upon the bone. It is of interest to note that in one particular family, the snakes (Fig. 4), whose body is not supported by limbs but is in close contact with the ground, instead of the middle ear arrangement of membrane and columella we find the columella attached directly to one of the bones of the skull. This arrangement

FIG. 1.
Fish.

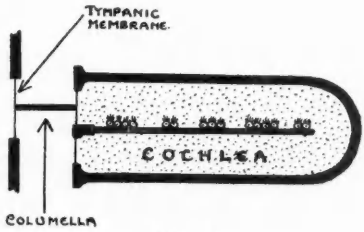

FIG. 2.
Amphibian.

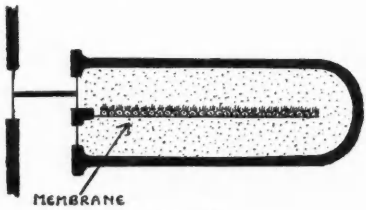

FIG. 3.
Bird.

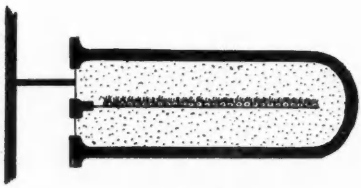

FIG. 4.
Snake.

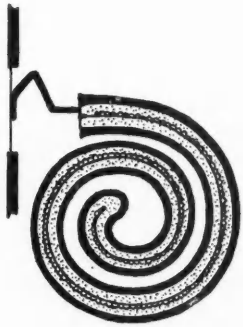

FIG. 5.
Man.

is almost certainly provided to enable them to perceive earth-borne rather than air-borne vibrations, *i.e.* a snake will perceive a footfall by vibrations conducted through the earth to the bones of its head. Two other interesting examples of adaptation of the auditory apparatus to environment are found in amphibious mammals, such as the seal, and aquatic mammals such as the whale. In both cases it is necessary to provide protection for the ear-drum during immersion. In the seal this is provided automatically by the presence of a valvular meatus which is closed by the pressure of the water. In the whale, in which, owing to its deep diving habits, pressures of as much as half a ton per square inch have to be provided against, the meatus is closed entirely, the ossicles being fixed to the bones of the skull. In this case, presumably, bone conduction is the only path of entry.

In man and other mammals (Fig. 5) we find the columella replaced by a chain of three ossicles, the malleus, incus and stapes, with a further development in length of the cochlea, which becomes wound into a spiral, presumably to allow of neatness in packing.

Following this brief account of the evolution of the organ, we must now consider in rather more detail the structure and method of working of the apparatus in man. Anatomically, we have the pinna or external ear, which has little if any function, although in many of the lower animals the concavity and mobility of the external ear is of the greatest importance in collecting and resonating the sound waves and in giving a sense of their direction. The meatus is long and sinuous, to allow of the delicate drum and nerve apparatus being placed deeply in the skull out of harm's way. The drum or middle ear (Fig. 6) is normally a closed cavity with a valvular opening (the

Eustachian tube) to the external air, by means of which the pressure within it can be regulated. It is closed externally by a very thin tympanic membrane, and stretching from this to the cochlea or internal ear is a bridge consisting of three little bones, the ossicles (*i.e.* the malleus, incus and stapes), loosely jointed together. The movements of the membrane and ossicles can be, to some extent at any rate, controlled by two muscles, the tensor tympani and stapedius, the former of which, when in action, tightens the tympanic membrane, while the latter, by tilting the stapes, probably limits the range of its movements. The cochlea consists essentially of a tube filled with liquid, the endolymph, and contained in a bony capsule. The cochlea has stretched across it the basilar membrane, which consists of a closely-arranged layer of fine fibres which vary regularly in length and probably in tension from one end to the other. (Fig. 8.) Seated on this membrane are the sensory cells or organ of Corti. The essential parts of this organ are nerve cells which bear upon their surface hair-like processes embedded in a gelatinous membrane. The cochlea is in relationship with the middle ear by two windows, one of which, the oval window, has inserted into it the footplate of the stapes, while the other, the round window, is closed by membrane. The hair cells of the cochlea are connected with the centres of hearing in the brain. There is still some degree of uncertainty as to how this auditory mechanism functions, but I will endeavour to indicate what, in view of the results of both experimental and clinical research, is the most probable method. Sound waves enter by the air of the meatus and impinge upon the tympanic membrane. From this there are three possible paths for the

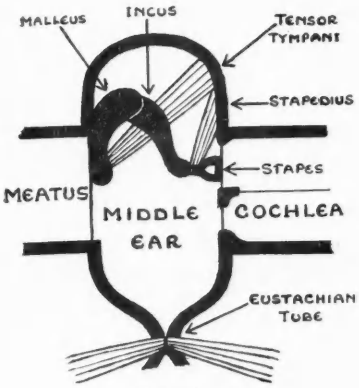

FIG. 6.
Normal middle ear.

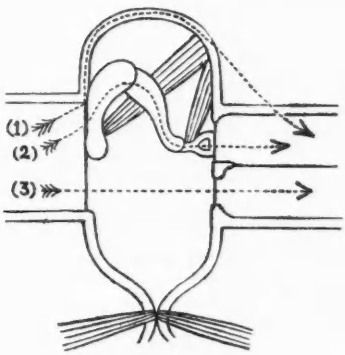

FIG. 7.
Paths of conduction.

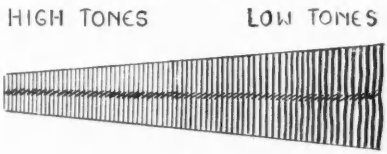

FIG. 8.
Basilar membrane.

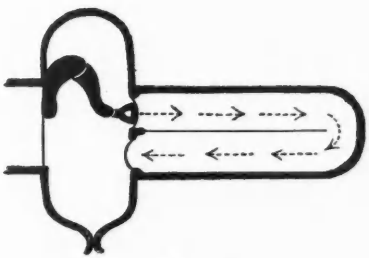

FIG. 9.
Pressure wave in cochlea.

vibrations to take to reach the cochlea. These paths (Fig. 7) are :—

1. By bone conduction, the vibrations being transmitted via the surrounding bone.

2. The ossicular route, the movements of the membrane being transmitted by the ossicles to the stapes and hence to the cochlea.

3. By the aerial route, the vibrations being transmitted from the membrane across the air of the middle ear to the membrane of the round window and hence to the cochlea.

It is of importance to decide which of these routes is the more important. Route 1 by bone conduction probably plays a very minor part in hearing in man, although in some of the lower animals, as has already been said, it may be the essential path. Route 2, the ossicular path, is at first sight the obvious one, and has been regarded as the essential route until recently. It now seems probable, however, that the third, or aerial, route of conduction is of as great, if not of greater, importance.

I might, perhaps, indicate some of the evidence which supports this view. Firstly, it has long been realized that excellent, if not perfect, hearing can exist when membrane and ossicles are lost. Obstruction of the round window by pathology or experiment, however, tends to produce a high degree of deafness. The physical arrangement of the middle-ear cavity also favours the conduction of sound vibrations to the round window rather than to the stapes. If we conclude, therefore, that the elaborate ossicular machinery of the middle ear is not solely designed for the transmission of sound waves, what is its alternative function ? We have an air-containing cavity, the pressure within which is under control

by the Eustachian tube. There is a bridge across this cavity formed by the ossicles and stretching from the membrane to the oval window in the wall of the cochlea. The tension of this bridge can be varied by the action of the tympanic muscles and also by the air pressure within the middle ear. Variations in this tension must produce variations in the physical conditions within the middle ear and cochlea, and it seems probable that one object of this apparatus is to provide a mechanism of accommodation by which the optimum tension can be maintained within middle ear and cochlea, and by which an adequate, but not excessive, amount of sound wave or stimulus can be passed on to the delicate nerve endings.

To turn now to the mode of action of the cochlea. Since Helmholtz propounded the idea that the perception of pitch was carried out by sympathetic vibration of particular portions of the basilar membrane (Fig. 8) to the particular tone, and thereby stimulating the hair cells lying thereon, a fierce battle has raged as to the correctness or otherwise of this view. I myself think that there is now little doubt that some such method of action occurs. There is a great deal of evidence in favour of this theory, and I propose briefly to indicate a portion of it.

It has been found that in cases of so-called occupation-deafness, in which a defect in hearing results from continued subjection to loud sounds, an area of degeneration is found in the organ of Corti, and such degeneration is constant in position for sounds of any given pitch. Similarly, it has been experimentally shown in animals that damage to the basilar membrane at any particular level will produce a defect in hearing for tones of a certain pitch and not

for others. From the clinical side cases are also occasionally seen in which one is justified in diagnosing a disease in the cochlea and in which there is found a loss of hearing for particular tones. I have recently seen the most perfect example of this, nature's experiment, in support of the theory of resonance in the cochlea. The patient, during the course of an attack of mumps, became deaf in one ear. It is well recognized that occasionally mumps will produce damage in the cochlea, but such damage is, as a rule, so widespread as to destroy the hearing in the affected ear entirely. In this particular case, however, the injury to the cochlea had resulted in an absolute loss of hearing for high tones only, there being a sharp line of demarcation between those tones which were heard and those which were not. It is difficult to explain this observation on any other ground than that particular regions of the cochlea serve for hearing particular tones. We must, therefore, conceive of the cochlea as consisting of a series of strings, each one of which vibrates in response to its particular tone and transmits the sensation for this tone to the centres in the brain. These strings are immersed in fluid and contained in a cavity in dense bone. Since fluid is incompressible, a window is provided at either end of the tube to allow for passage of the sound waves, so that when the stapes is pushed inwards in the oval window the membrane in the round window can be forced outwards. (Fig. 9.)

Having thus briefly considered the normal mechanism of hearing, we must now consider what changes may take place in the production of deafness. As far as the meatus is concerned, any blockage will, of course, produce some degree of deafness, and I have nothing further to say as to this.

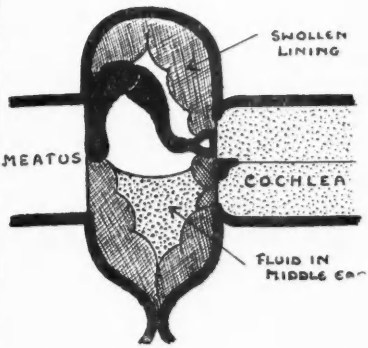

FIG. 10.
Acute inflammation of middle ear.

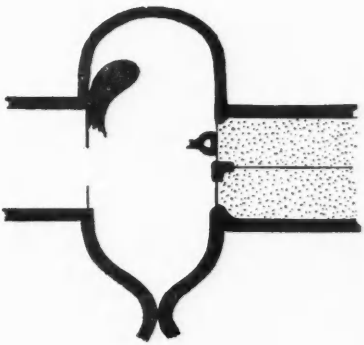

FIG. 11.
Results of inflammation (1).

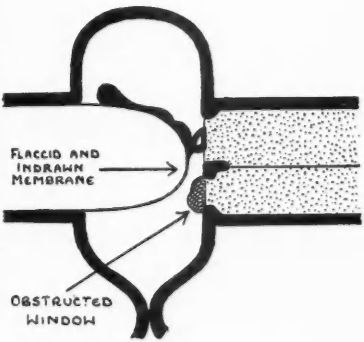

FIG. 12.
Results of inflammation (2).

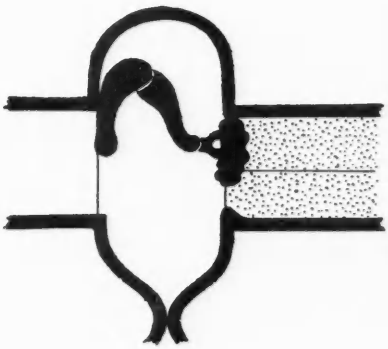

FIG. 13.
Otosclerosis.

THE MIDDLE EAR.

Attacks of inflammation in the middle ear are extremely common, and are responsible for a considerable proportion of the total cases of deafness. Such inflammation, for practical purposes, always spreads to the middle ear by the Eustachian tube, its only communication with the exterior. This being the case, such conditions are always secondary to inflammations in the nose and throat. Inflammation in the middle ear may produce a defect in hearing in various ways. Thus, there may be in the acuter stages (Fig. 10) an accumulation of fluid and a swelling of the lining, while as a later result the membrane and ossicles may be destroyed (Fig. 11) in whole or in part or may be altered in structure so as to be unduly rigid or flaccid. (Fig. 12.) The windows into the cochlea may also be obstructed. Finally, as a result of obstruction to the Eustachian tube, you may have induced a positive or negative pressure within the middle ear. It will be realized, therefore, that the actual mechanical conditions in the middle ear producing a defect in hearing may be extraordinarily diverse, and we are as yet uncertain as to what mechanical conditions will produce the maximum degree of defect. Clinical experience and experimental evidence does, however, establish that interference with the windows into the cochlea is probably the most important factor. (Fig. 12.)

One great difficulty in considering the results produced by changes in the middle ear is that it is not by any means easy to decide how far the defect in hearing produced is due to interference with conduction of the sound waves through the middle ear and how far it is due to secondary changes in the

cochlea. In addition to inflammation and the results produced by it in the middle ear, we have also to consider a mysterious complaint, otosclerosis. In this condition changes take place in the bone surrounding the windows, and as a result of these changes the stapes tends to become firmly fixed in its window, resulting in a high degree of deafness. This complaint, otosclerosis (Fig. 13), is responsible for a very large number of cases of deafness. It is chiefly met with in women, shows a strong hereditary tendency, and there is some evidence suggesting that some abnormality of internal glandular secretion, possibly of the parathyroids, is a factor in its causation.

THE COCHLEA.

As has already been indicated, the organ of Corti, the essential sensory organ in the cochlea, is extremely easily damaged by disease or injury. Just as in the eye the maintenance of correct pressure of the fluids contained in it is essential for the proper functioning of the nerve endings (any undue increase of pressure resulting in the condition known as glaucoma), so in the cochlea is this factor probably of even more importance. Owing to the fact that the cochlea is embedded in dense bone within the skull, it has, up to the present, not been possible to obtain any experimental evidence as to variations of the pressure of its contained fluid. I believe, however, that such variations in pressure are of the utmost importance in the pathology of deafness. Some variation in pressure probably results from a vast variety of causes. As has already been indicated, changes in pressure in the middle ear are certainly to some extent transmitted to the cochlea. To give a simple example of how

easily pressure changes are induced in the cochlea, I can mention the familiar fact that hanging the head will, in most individuals, induce a buzzing in the ears, the explanation probably being simply an attempt to overfill the cochlea by the distended blood vessels. This being the case, it will be understood that any complaint which affects the general circulation or the general balance of tissue fluids may produce changes in the pressure within the cochlea and therefore a defect in hearing. It seems probable that changes in pressure, if of short duration, will produce merely a transient defect in hearing. On the other hand, if long continued, it is probably followed by a degeneration of the nerve elements and therefore by a permanent defect.

I have observed in a long clinical experience of some cases of deafness that they tend to exhibit periods in which the hearing improves and periods in which it becomes worse, without any accompanying change in the middle ear to account for this, and I believe that such cases are to be explained by intermittent variations in pressure.

Apart from pressure changes in the cochlea, cases of actual damage to the organ by disease or injury are, of course, not infrequent. As an example of injury, any unusually loud sound, such as an explosion or prolonged sound above a given intensity, tends to produce degeneration of the organ. As an example of disease, one can instance syphilis, in which both the congenital and acquired varieties may produce widespread destruction of the nerve elements.

What can be done to prevent or remove these various pathological conditions ? As far as the meatus is concerned, the problem is simply one of maintaining an open tube. In the case of the middle ear we have

to consider the essentially different problems of the prevention or control of inflammatory changes and otosclerosis. Inflammatory changes are amenable in practically all cases during the early stages, and the key to the prevention of such cases of deafness in the adult lies in the early and efficient treatment of the primary inflammatory condition in childhood. Much has been done in this direction, and no doubt more will be done in the future. The medical inspection of school children, with the resulting early treatment of those cases in which deafness is apparent, is producing fruitful results, as is also the systematic treatment of ear complications in cases of acute specific fevers, such as scarlet fever and measles, in isolation hospitals. During the last few years the public authorities have, in the larger centres, appointed specialists on diseases of the ear to deal with such cases, and, as a result, one is seeing fewer and fewer cases in which a suppuration in the ear resulting from scarlet fever has been allowed to drift on into a chronic condition with resultant damage to the hearing.

In Glasgow Dr. Ker Love[1] has had an opportunity of reviewing the percentage of acquired cases of deafness in school children during the last forty years, and he finds that such percentage has dropped by one half. In addition to more efficient treatment in the early stages, he rightly attributes this improvement to improved social conditions, *i.e.* better housing, feeding and clothing, etc. Some five years ago I analysed my private records, covering a period of sixteen years, to try and ascertain to what degree we had succeeded in the prevention of chronic ear disease. These figures seemed definitely to show that the incidence of chronic suppurative disease in the middle ear is decidedly on the down grade. They applied to

private cases in which the factors of school inspection and improved social conditions did not operate, so that in them we must give the credit to more systematic treatment.

Apart from the ideal of prevention, what can be done towards alleviating the deafness resulting from old-standing inflammation? While something has been done, it is here I feel that there is room for considerably further clinical research. Until further light has been thrown on the exact method by which the machine works—and this I feel is most likely to result from careful clinical research into a large number of cases—our methods of treatment in any individual case are necessarily experimental. That there is hope in the future that much may be done is, I think, suggested by the following isolated observations:—

1. In some cases of middle-ear deafness, if an opening is made artificially in the membrane a dramatic improvement in hearing ensues.

2. In some cases in which there is already a hole in the membrane, if this be closed temporarily by a patch or a plug, forming the so-called artificial drum, the hearing is again sometimes dramatically improved. It has seemed to me that the startling results sometimes obtained by the use of an artificial drum should, if correctly interpreted, throw a considerable amount of light on the mechanism of hearing. I have tried to carry out some research into a few such cases, and perhaps it might be of interest briefly to detail the results of two typical experiments. In the first of these (Fig. 14) the closure of a small hole in the tympanic membrane by means of a piece of cigarette paper produced a very considerable improvement in the hearing. I suggest that in this case the improvement is due to the re-conversion of the middle ear into a

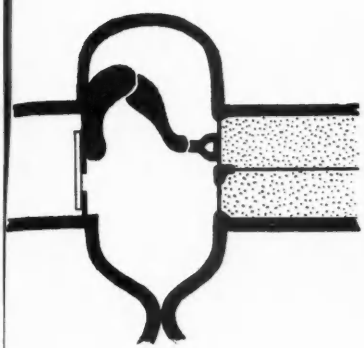

FIG. 14.
Artificial drum (1).

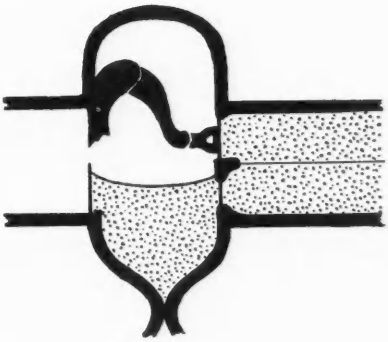

FIG. 15.
Artificial drum (2).

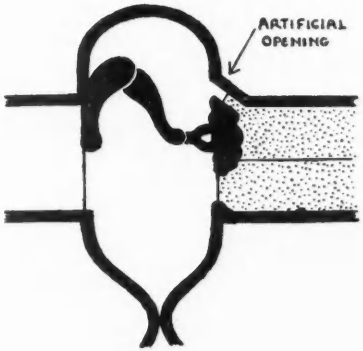

FIG. 16.
Otosclerosis operation.

closed air-containing cavity, thereby enabling the normal conduction of sound waves by the aerial route across the middle ear to be re-established. In the second experiment (Fig. 15), in which there was an extensive loss of tympanic membrane, the introduction of fluid into the middle ear cavity to such a level as would cover the round window produced improvement in the hearing. Further filling up to the level of the stapes in the oval window produced a lowering of the hearing. I suggest that this observation can be explained as follows. Before the introduction of the fluid sound waves entered the cochlea by the round and oval windows simultaneously. These waves would tend to meet and neutralize (see Fig. 9), thereby diminishing the effect on the nerve endings. The screening of one window, however, by the liquid prevents this.

Treatment directed towards restoring the patency of the Eustachian tube or, as far as possible, towards the replacement of the membrane and ossicles in their correct position, has occasionally produced good results; but, as a whole, it seems to me that progress is likely to lie in the direction of getting rid of stiffened and ill-acting structures in the middle ear, rather than in attempting the usually impossible task of restoring them to efficiency.

As far as our knowledge goes at present, what seems to decide the possibility of improvement or not, as far as the middle ear is concerned, is the efficiency of the structures in the windows into the cochlea rather than the condition of the structures in the middle ear itself. This fact brings us on to the consideration of otosclerosis, which, while a problem in itself, does resemble the mechanical conditions presented in many cases of inflammatory disease, in that it results in the blocking of one of the windows.

OTOSCLEROSIS.

As far as otosclerosis is concerned, two problems await solution. Firstly, the exact nature and mode of origin of the disease must be ascertained, and it is then possible that treatment may do something towards preventing its development in the individual case. Until this has been ascertained all that can be done in the way of prevention is by the limitation of reproduction in families in which the disease occurs. Secondly, efforts must be directed towards removing the mechanical results of the disease, and thereby improving the hearing. Some degree of success has already been made at the hands of Sourdille[2] by the provision of a new artificial opening in the wall of the cochlea. (Fig. 16.) This idea is not a new one, but it will be understood that the technical difficulties involved in making a new window and in maintaining its patency are very great.

WHAT HAS BEEN DONE AND WHAT MAY BE DONE IN THE FUTURE IN REGARD TO THE COCHLEA?

It should be possible to prevent damage by loud sounds by taking precautions to prevent their access to the cochlea. As an example of what I mean I may instance the closure of the meatus by special appliances during gun firing. We all know that attempts have been made to delay the onset of senility, and should such attempts prove successful we shall no doubt have no longer to shout at the aged! It has been said that many diseases may affect the nervous structure of the cochlea, and syphilis was instanced as an example. A very considerable proportion of cases of extreme deafness in children and in adults is due to syphilis, and on the whole treatment does little

in such cases, at any rate when once signs of damage to the ear become apparent. Prevention of this type of deafness must, therefore, lie in the direction of further efforts towards the total abolition of the disease.

The problem of treatment in cases in which defects in labyrinthine tension are an important factor is similar to that involved in general constitutional defects such as arteriosclerosis, which seem to result from the very unphysiological lives lived by so many of us, in which over-eating, over-smoking, and excesses of all kinds play such a large part. Prevention here lies in the direction of a more simple and natural life, but the treatment of such conditions when established is difficult. The correction of errors in living is often only possible to a limited degree, and is productive of only a limited degree of improvement. Some particular drugs, however, of which pilocarpine is an example, do seem to have some direct action on the labyrinthine pressure, and it seems possible that further progress may be made in this direction.

As a last resort, in cases in which the hearing is so defective that conversation cannot be carried on or only with great difficulty, mechanical aids may be of the greatest utility. The deaf have always been the natural prey of charlatans, and the advertising columns of any cheap newspaper will demonstrate that this is still the case. The principles underlying aids to hearing are simple. Such aids can be classified into two classes: electrical and non-electrical. Dealing first with the second group, non-electrical aids, these are represented in the simplest form by the conversation tube, which consists of a tube conducting the sound waves direct to the ear. In other varieties the use of an expanded end as a sound collector to receive the

waves increases their efficiency. In yet others this expanded end, by being made flask-shaped, introduces an element of magnification by resonance. Broadly, the larger the non-electrical aid the more efficient it is likely to be, and any small non-electrical instrument which can be introduced into the meatus must be useless.

Electrical Aids.—Until recently these all depended on the conversion of sound waves into electrical ones with their magnification and reconversion to sound waves, *i.e.* the micro-telephone. With this machine it is possible to obtain extreme degrees of magnification, but there is usually some distortion introduced and some tones are magnified more than others. This defect does, however, introduce the possibility of further improvement. In the majority of cases of deafness the defect in hearing is most marked for particular tones, and the time may not be far distant when it will be possible to fit any given patient with an electrical apparatus which will magnify those tones which are least well heard.

Another entirely different principle has recently been employed by which the sound waves are magnified by a wireless amplifying circuit. This arrangement produces the maximum of magnification with the minimum of distortion, but unfortunately the apparatus is so cumbersome as to prevent its being used except in one location.

In conclusion, a word as to the mental side of deafness. It requires a mental effort to use any sensory organ which is defective, and many deaf people, owing to the effort involved, give up trying to hear. It is therefore of the utmost importance both to encourage them to listen and by aids, or any other means within one's power, to persuade them to exercise their hearing

to the greatest possible degree. By this alone it is possible in many cases not only to prevent the hearing from further deteriorating but in some degree to improve it.

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[2] *Ibid.*, 1930, xlv. 601.

PROGNOSIS IN CORONARY THROMBOSIS.

BY

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NOT so many years ago, if a candidate in one of the higher examinations had been questioned as to the prognosis of coronary thrombosis, he might have answered with impunity that there is none. The past decade has, however, brought to light the fact that many people do survive these catastrophes. Various series of cases have been reported which bear this out, and to these I add notes drawn from 144 patients seen by myself. Examples of sudden death without benefit of medicine, discovered post-mortem to be due to coronary thrombosis, have been excluded from this series; for the object of these remarks is to help the doctor who, standing by the bedside of someone struck down by cardiac infarction, has to furnish to himself and others some sort of estimate of the patient's chances of recovery.

Now, two broad facts emerge from this study. The first is that 49 out of 144, or 1 out of 3, died in or shortly after the attack. Secondly, of the 83 survivors

whose attacks occurred over a year ago 51 are still living. In other words, about one-third of those who survive the attack die within the year. It is only fair to add that with increasing experience one is more and more ready to make a diagnosis of coronary thrombosis in relatively mild cases. The present series included none except those in which the diagnosis would command general agreement. If debatable cases were added, these would dilute the fatalities and furnish a better picture of the prospects.

These general data can also be used as tests of the influence of several ætiological factors and clinical features. In all the tables that follow (except the last) the first column refers to the total number of cases reviewed. The second column expresses in percentages the proportion of those who survived the attack itself. The third column refers to the percentage of those who, after living through the attack, had also survived through the subsequent year. The ages of the whole series may conveniently be considered in three groups; those who were under sixty, those who were seventy or over, and those whose ages lie between, in the seventh decade. The following table expresses the influence of age on the prognosis:—

Age.	Total Number.	Non-fatal attacks.	Non-fatal and surviving a year or more.
Under 60	48	66·6%	51·8%
60–69	66	75·7%	71·1%
70 or over	30	43·3%	70·0%

The influence of sex may be tested in the same way :—

	Total Number.	Non-fatal attacks.	Non-fatal and surviving a year or more.
Males	106	68·8%	58·0%
Females	38	57·9%	75·0%

A family history of liability to what may be broadly called coronary disease is too vague a factor to estimate in figures, yet I believe it is an unfavourable feature. I have seen examples of fatalities in people with this kind of history which seem to me proportionally more numerous than in those who have no such history; but I must admit that I can produce no reliable figures in support of this impression.

The state of the heart before the attack may be supposed to influence the prognosis, but it is difficult, in a majority of cases, to get much precise information about this. However, it is practically always possible to learn whether the patient has or has not been liable to cardiac pain on effort. The present series may from this point of view be divided into a group of 64 who gave a history of this kind, and 80 who did not. In tabular form the prognosis of these two groups may be compared thus :—

	Total Number.	Non-fatal attacks.	Non-fatal and surviving a year or more.
Attack preceded by pain on effort ..	64	65·6%	57·1%
Not preceded by pain on effort..	80	66·2%	64·5%

All that can be drawn from this series as to the influence of background on prognosis, therefore, is the

somewhat obvious fact that patients of seventy and over stand up to this calamity less successfully than do patients who are not so old.

The prognosis, perhaps, depends more on the severity of the attack than on the background. But how is that to be measured? There are two kinds of evidence, those which arise immediately from the anatomical change in the heart, and those which express the same thing in terms of function—data derived from the state of the peripheral circulation. Now, after examining all the evidence directly proving a structural change in the wall of the heart which was at my disposal, I found that it was not possible to use any simple clinical criterion of gross cardiac damage save one—the presence or absence of a pericardial rub. Here again, therefore, I divided my cases into two groups, those in which friction was heard and those in which it was not. The prognosis in these two groups I express again in tabular form.

Pericardial friction.	Non-fatal attacks.	Non-fatal and surviving a year or more.
Heard in 42	57·1%	70·0%
Not heard in 102 ..	75·4%	58·7%

The cases in which a pericardial rub is heard are, therefore, rather worse off so far as the immediate prospect is concerned than those in which it is not heard. Again, the outlook is, perhaps, a little less hopeful when the pain is abdominal than when it is thoracic, as the following table shows:—

	Total Number.	Non-fatal attacks.	Non-fatal and surviving a year or more.
Pain abdominal ..	28	57·1%	64·2%
Pain thoracic ..	116	68·1%	60·8%

The influence on the prognosis of the electrocardiographic picture is not easy to state in terms of figures; in fact, it would be impossible to do so, as far as my own experience has gone, because it has not always been possible to collect the necessary data. So often the patient is too ill for early electrocardiography. Persistent ventricular tachycardia is generally admitted to involve a bad prognosis. Probably it is true here, as in cardiac disease in general, that the most serious changes are those which prove the greatest damage to the ventricular walls. Equally it is true that the course of the case towards recovery can be estimated more accurately if electrocardiograms are taken at intervals.

The immediate danger in cardiac infarction is that the heart will not be able to fill the peripheral circulation. It is accordingly to the signs of that failure that we should turn for a measure of the prospect of recovery. It is this that makes extreme pallor so ominous a symptom. The rate of the pulse is not a good guide. I have known the heart beat at a normal rate in a fatal case up to the moment at which breathing ceased to be rhythmic, a few minutes before the cardiac sounds disappeared. On the other hand, measurement of the blood-pressure nearly always gives reliable evidence of the extent to which the efficiency of the peripheral circulation is impaired. The most significant feature of the blood-pressure in coronary thrombosis is the fall in the systolic tension. It is not always possible to be sure that this has

taken place, for in many instances the pressure before the attack was unknown; but what is, after all, the most direct measure of the efficiency with which the damaged heart is filling the vessels is the pulse-pressure. My custom (based on a long series of actual data) is to regard the pulse-pressure as normal if it is about 40 per cent. of the systolic pressure. In coronary thrombosis, however, and other forms of severe ventricular failure, it may fall as low as 10 per cent. The following table shows that a fall to 25 per cent. or below is a bad sign:—

Pulse pressure/Systolic pressure = 25 per cent. or less; bearing on prognosis.

	Died in attack.	Died in year following attack.
Whole series (144)	34·0%	38·5%
P.P. low (27)	70·4%	100·0%

Unfortunately, it is not possible to claim the converse, that patients with a wide pulse-pressure are sure to recover; yet if I were compelled to rely for prognosis on one sign alone it would be the pulse-pressure that I should choose. Curiously enough, an alternating pulse is seldom found except when the immediate attack has been survived and secondary ventricular failure has set in. I say "curiously" because narrowed pulse-pressure and an alternating pulse are so often associated in the progressive ventricular defeat of the hyperpietic. There is no time to discuss in detail the course followed by signs and symptoms in those who survive the initial onslaught. The

more evidence there is of damage to ventricular muscle and reduction of ventricular output the worse the prognosis. Persistence of fever and of leucocytosis are bad signs. Returning vigour of sounds and beat and rise in the pulse-pressure are favourable. Of complications, glycosuria and embolic accidents make the outlook graver still.

The ultimate outcome in those cases surviving both the attack and the subsequent year cannot yet be summarized statistically, because the period during which they have been observed is not long enough. It is only fair to claim, however, that in many of these a recovery that is apparently complete has taken place. That is to say, the patients have been enabled to resume and carry on with their work provided it is not too arduous, and to survive the attack by at least a decade. This is in accordance with the experience of those who have followed up similar series. The same lesson is taught when post-mortem evidence brings to light the cicatricial remains of cardiac infarction, which must have occurred many years before death.

Finally, there is no doubt that with an increasing accuracy of early diagnosis the prognosis is improving. Early diagnosis leads to thorough treatment, based on an adequate period of rest, and in this way an appreciable number of lives are saved.

SUMMARY.

Of a series of 144 clinically diagnosed cases of coronary thrombosis approximately one-third died in or shortly after the initial attack.

Of those who survived the attack about one-third died during the ensuing year.

The severity of the attack appears to have more prognostic import than the state of the patient before the attack.

The degree to which the pulse pressure falls is a good index of the severity of the attack.

EDITOR'S NOTE.

A sad interest attaches to this paper, the proofs of which were returned by Dr. Carey Coombs on the day before his death with a letter saying that he was sending " an alternative paragraph to the one already in my paper. I think it is only fair to others in the same boat to dwell a little more than I have done on the bright side." The paragraph in question has been added in brackets on page 283.

THE EFFECTS OF LIGHTNING: WITH ESPECIAL REFERENCE TO THE NERVOUS SYSTEM.*

BY

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SCIENTISTS and philosophers have interested themselves in the phenomenon of lightning for the past 2,000 years. Since the time of Seneca[1] numerous treatises have appeared on the nature of lightning and upon its effects upon the organism. Prominent amongst these are the monographs of J. A. Dietericus,[2] 1696, J. A. Münnich,[3] 1732, F. J. Baier,[4] 1756, C. F. Hoffmann,[5] 1766, J. G. Biedermann,[6] 1768, and of P. C. Abilgaard,[7] 1771. Among the more recent works special mention may be made of those by C. C. Bonnet,[8] 1859, and F. Sestier,[9] 1866. Especially valuable have been those medical studies of the major lightning disasters. Thus, L. Weber's report[10] on the Schleswig-Holstein disaster of 1878, in which ninety-two people were struck, is among the first scientific studies of the effects of lightning-stroke.

In more recent times we have F. Panse's investigation[11] of the Königstein disaster. On Easter Monday, 1925, twenty-nine tourists were being conducted by a guide over the fortress of Königstein in Saxony. A lightning-flash struck the party, killing outright three and injuring twenty-six others. The services of Dr. Panse were requisitioned in order to study and assess the effects.

* Communicated to the Bristol Medico-Chirurgical Society, on 9th November, 1932.

Numerous isolated case reports are contained within the literature for the past 200 years, detailing the clinical and pathological consequences of lightning accidents. Among the earlier of these we find the account of Professor Richmann, who was killed in his laboratory in Leningrad while studying the charges collected by a lightning-rod on the roof and conveyed to his room.

In this country, owing perhaps to our comparative immunity from severe thunderstorms, only few studies have been made. A. J. Jex-Blake's Goulstonian Lectures[12] for 1913 on "Death by Electric Currents and by Lightning" require particular mention. Within the last year an interesting account of lightning-strokes has been made by H. A. Spencer,[13] who as Medical Officer in the Transvaal has had considerable experience of the many severe storms encountered in that country.

THE NATURE OF LIGHTNING.

According to G. C. Simpson,[14] lightning comprises an electrical discharge operating at a potential of some thousands of millions of volts. An enormous amperage is generated, amounting to 20,000 to 100,000 amperes. The current is of the alternating type, with a large number of reversals each second. The duration of the electrical discharge is short, amounting to approximately one-thousandth of a second.

THE EFFECTS OF LIGHTNING.

Of immediate interest are the effects which lightning-stroke may produce in an individual. In view of the layman's interest in this subject, it is strange that so little accurate scientific information obtains as to what precisely occurs in these cases. Boudin's

description (1855) of the characteristic effects of lightning as ". . . amazing, protean, contradictory, mysterious," may be more picturesque than accurate, but it does illustrate the inherent difficulties of the problem.

A considerable proportion of lightning accidents prove fatal. The risk is the greater the more direct the lightning impact; the region of the body most affected is of importance, for according to Sestier, who analysed 600 cases, two out of three are killed when the lightning injures the head.

Widespread injuries may be found on the body, resulting not only from the lightning impact but also from the fall. Clothing and boots may be ripped into fragments or even blown completely off the victim. Cadaveric rigidity comes on early and quickly wears off; decomposition sets in unusually soon. The appearance of the corpse soon after the accident may show unusual trance-like or cataleptic postures. An old-time description tells that eight farm labourers were struck while resting at dinner-time under an oak-tree. They appeared, when found, to be still eating. One held a glass, one was carrying a piece of bread to his mouth and a third held a plate. On another occasion a woman was killed while picking a poppy; the body was discovered with the flower still in the hand.

We are just as uncertain as to the cause of death in lightning accidents as with electrical shocks. Experimental evidence does not necessarily apply to human cases. There are two main theories, namely primary heart failure from ventricular fibrillation, or medullary inhibition of respiration. Older views on this problem are of interest. Münnich (1732) believed death was due to a vacuum caused by the

lightning which made the blood give up its gases and tear the weaker blood-vessels, especially in the brain and medulla. Hoffmann (1766) was less dogmatic; he suspected "some lesion of the nerves and brain inaccessible to the senses and too delicate to be demonstrable."

Pathological study in fatal lightning accidents reveals numerous gross injuries in addition to burns and skin markings. Fractures of bones of the limbs or of the spine or the skull may be found. Sometimes a limb is severed as cleanly as by surgical amputation. Within the nervous system gross lesions may be noted. Extravasation of blood from the meningeal or from smaller vessels within the medullary substance are described; at times the whole brain has been found diffluent and disorganized as though subjected to the action of high temperatures.

Even in non-fatal cases considerable injury may be inflicted by a lightning-stroke. Among the more immediate of these effects may be mentioned shock and unconsciousness.

In contradistinction to electrical accidents, the victim of lightning experiences little or no sensation when struck. Often he is rendered unconscious without warning, and on recovery can give no account of what has happened. This has been known for centuries, and Pliny, indeed, affirmed that ". . . . the man who sees the lightning and hears the thunder is not the one who is struck." Too much emphasis cannot be laid here, however, for it is possible that a short period of retrograde amnesia may prevent the victim from recalling and describing the events of the stroke, although sensation may have been abundantly present.

At times, however, sensations are experienced

prior to unconsciousness, and are remembered afterwards. The usual description is of a flash of light or of colour; at times there is mention of a "rush of wind." Or the patient may feel himself struck a terrific blow. When several are struck simultaneously the victim may remember noticing his companions fall to the ground unconscious, and more than once it has been stated how gradually and slowly the victims seemed to sink to the ground.

Consciousness is almost always lost; the interval between the lightning-stroke and the unconsciousness is usually of extreme shortness. During this state of concussion the patient lies immobile, and shows none of the restlessness, tremor or myoclonic twitchings which may be seen after electrical shock. On the other hand, the condition differs from that in head injury in the severity of respiratory and circulatory disorders. The duration is rarely prolonged beyond an hour or two, and is usually, indeed, considerably shorter. Recovery is fairly abrupt, but may be succeeded by abnormal psychical states which will be described later. Retrograde amnesia usually does not occur.

Various types of disorder may be found by the patient on recovering consciousness. These may be described under three heads, viz. burns, ocular disorders, and neuro-psychiatric symptoms.

According to Spencer burns may be of three types. (1) *Linear burns*, due to the direct effect of the lightning current. These are seen as strips measuring from one-eighth to one inch in width, and extending at times for a foot or more, "as if the victim had been scourged." Sometimes these burns follow the tract of most perspiration, and may outline every crease and wrinkle of the body (Spencer). (2) *Filigree or*

arborescent burns. These are well known even to the laity, who from time immemorial have envisaged them as the imprint of surrounding foliage or scenery upon the victim's body through the medium of the lightning-flash. Several quaint examples of these "keraunographic markings,"—or Lichtenberg's flowers, as they were sometimes called—were reported to the British Meteorological Society in 1857 by Poey:—

A man standing opposite a tree which had just been struck by lightning was very much surprised to find on his chest a facsimile of that tree. (Benjamin Franklin, 1786.)

A boy climbed a tree to unnestle a bird; the tree was struck and the boy thrown to the ground. On his chest was plainly imprinted the image of the poplar-tree and the bird in the nest. (Raspail, 1855.)

During September, 1825, lightning fell on the foremast of the brigantine *Il buon Servo* in the Bay of Arriero. A sailor sitting under the mast was struck dead, and on his back was found the imprint of a horseshoe, similar even in size to the original one fixed to the top of the foremast. On another occasion a sailor, standing in the same situation, had on his breast the impress of a number 4·4 with a dot between the two figures. This exactly resembled the 4·4 which was fixed to the extremity of one of the masts. (Orioli.)

Shortly after Poey's communication, the Secretary of the Meteorological Society received the following communication from James B. Shaw on "the photographic effects of lightning":—

Six sheep were killed by lightning in 1812 at Coombe Hay, four miles from the city of Bath. At that time outside the village lay an extensive wood of hazel and detached oak-trees, in the centre of which there was a clearing where the dead sheep were discovered. When the skins were taken from the animals a facsimile of that portion of the surrounding scenery was visible on the inner surface of each skin. "I remember that it caused a great local sensation at the time, and the skins were exhibited at Bath, and I have no doubt there are many living now in that neighbourhood who could vouch for the

correctness of this statement. I may add that the small field and the surrounding wood were so familiar to me and my school-fellows, that when the skins were shown to us we at once identified the local scenery so wonderfully represented."

Although Spencer regards this type of burn as of bad prognosis and indicative of a severe stroke from a considerable streak of current, I have known them appear in slight cases of lightning-stroke, and disappear within twenty-four hours.

The third type of cutaneous lesion comprises the *surface burns*, occurring beneath metallic objects worn or carried. Derendinger narrated in 1865 that he was returning home by train when he found that he had lost his pocket-case, a tortoise-shell affair with a silver monogram of two "D's" intertwined. Later he was summoned to attend a man found unconscious under a tree, having been struck by lightning. On the thigh was a burn shaped liked two interlaced "D's." The doctor suggested that his lost case might be in the man's trouser pocket, and so it proved.

Ocular disturbances are not uncommon immediately after a lightning-stroke, and may even appear after some interval of time. Among the immediate affections of the eye may be mentioned intense photophobia from conjunctivitis and episcleritis. Retinal œdema and even detachment have been described. Sometimes there is a vasomotor disorder within the globe leading to the appearance of papillœdema. Ocular palsies, of a transient nature, are also on record. Among the sequelæ of lightning-stroke two may be mentioned, namely cataract and optic atrophy. The former, although actually not a frequent occurrence, has been known for a great many years; thus we read in Garcaeus: ". . . *Humorem cristallinum oculorum exsiccat et liquefacit, quo exsiccato aut liquefacto, cecitatem*

sequi necesse est." Disorders of the oculo-sympathetic are not unknown, leading to permanent pupillary disorders (mydriasis, aniscoria, loss of light reflex, pupillary myotonia).

Immediately on recovering consciousness the patient may complain of severe pains in the trunk or limbs, or in one segment of the body only. These pains are usually transient in character. Sympathetic disturbances are not rare, and may persist for some time.

Thus there may develop vasomotor spasms, cyanosis, pallor or œdema of a limb, hyperhidrosis, tachycardia, a peculiar hard œdema of the muscles. Disturbances of the oculo-sympathetic system have already been mentioned.

Curious psychological states have been noted immediately after recovery from lightning concussion. The patient may pass into a state of noisy excitement with restlessness and anxiety; sleep is usually much disturbed on the night following the accident. Panse refers to the curious mental attitude of the survivors of the Königstein disaster. Although their mentality was clear, there was a strange calm or disinterestedness in a few of the victims. In most, however, there was considerable agitation. Soldiers who ran up found the victims extraordinarily excited and frightened, crying aloud for help. Each was thinking of himself, and seemed quite indifferent to the possible fate of his relatives. This stage of excitement gradually abated within the course of the following week.

Perhaps the chief characteristic of the lightning-stroke is the resultant impairment in nerve function. Immediately on recovering consciousness the patient usually notices an immobility and loss of feeling in the legs and lower part of the trunk. Many have the

sensation as if there were nothing below the waist. Although it is doubtful whether any victim has been carefully examined from the neurological standpoint, we possess sufficient information to know that actual paraplegia of a flaccid type combined with objective loss of sensation does occur. What the state of the reflexes is we do not yet know. Sphincteric control is apparently not affected. Within the course of the next hour or so (often within a much shorter period) sensation and power return to the limbs. A feeling of numbness, tingling or pins and needles accompanies this return ; pain is rarely complained of. At the end of twelve hours there is, as a rule, no demonstrable affection of power or of sensation, though a sluggishness of the tendon jerks has been noted.

Observations made during this period of paraplegia show clearly that severe vasomotor changes are present. The legs are white or livid, the toes often bluish, and the limbs are deadly cold.

Two patients in my series were sheltering from a heavy storm at the end of July, 1932, beneath a tree in Kennington Park. They were simultaneously struck by a flash of lightning and both immediately lost consciousness. Both regained their senses after a few minutes to find that they had lost all power and sensation from the waist downwards. This was confirmed objectively by the doctor at the hospital shortly afterwards, and it was noted that the legs and feet were quite cold and bluish-white " . . . as if going in for gangrene." No objective neurological abnormalities were present when I examined them a few days later.

The paralysing effect of lightning is borne out in a quaint account which I recently came across of the affidavit of one Joseph Lockier made on 30th September, 1806. The pamphlet narrates how Lockier, a servant to Mr. Batchelor, a publican of Monckton Farleigh, near Bath, was struck insensible

during a thunderstorm between six and seven in the evening of 19th August, 1806. His senses were restored gradually and imperfectly at first, so that at first he was barely capable of perceiving and distinguishing surrounding objects. He felt excessively cold, "the hands and feet swelled, the power of the lower extremities totally gone and those of the arms much impaired." He was totally incapable of articulating or of uttering any sound whatever, though he frequently attempted to. According to the pamphlet, the patient remained in an exhausted and enfeebled state for about fifteen days, during which time he dragged himself through the woods, subsisting entirely on rainwater and grass. Some time in the commencement of September he heard people in the wood with dogs and guns: he called feebly for assistance, but they thought him an impostor and went away. Eventually he was rescued by four men who bore him off in a cart, his limbs being still paralysed. The carters described his limbs "as flaccid and looking like wasted woman's hands." He could hardly articulate ". . . only in a whisper." He could not raise his arm or support it to have his pulse felt. After a little nourishment his pulse rate increased from ten beats per minute to twenty, the upper extremities became warm, but the legs remained cold, "the toes having the appearance of mortification." He was taken to Mr. Mason, surgeon, of Batheaston, whence he was transferred to the Bath Dispensary. There amputation of the toes was carried out. His case aroused considerable local interest among the medical staff, and a testimony as to the findings was drawn up and signed by Drs. Moodie, Murray and Crawford (physicians), Messrs. Creaser and White (surgeons), on 17th November, 1806.

Although the restoration of function is usually complete, one not infrequently hears the story that transient dysæsthesiæ reappear in the legs with each succeeding thunderstorm. One or two examples of these "psycho-recidives" may be quoted :—

A woman, while ironing, was stunned by a vivid flash of lightning and fell unconscious. Afterwards she felt a creeping sensation and numbness, particularly in one arm. This always increased when the air was charged with electricity, and she was always nauseated before a thunderstorm. (Macdonald, 1886.)

A neuropathic woman of thirty-eight was struck by lightning and her two children killed. For four days she was unconscious and afterwards found a left-sided hemiplegia and hemi-anæsthesia. In three weeks she recovered fully. Two days later, during a thunderstorm, she had a second attack. A third took place three years later under similar circumstances. (Camby, 1894.)

A man hit by lightning was able to resume work two days later. Since then with every succeeding storm he would develop tremors and internal agitation. One day, while working on a building during a storm, he was so overcome with tremor that he fell off the scaffolding and was killed. (Forster.)

Analogous cases have been described by Diener, Minonzio, Gerhardt, Reichl and Panse.

The nature of the lightning paralyses is conjectural. We do not know whether the seat of the dysfunction lies in the spinal cord, in the peripheral nerves, or in the autonomic nervous system, or even, indeed, whether structural changes exist at all. Many incline to the view that the paralytic symptoms are psychogenic in type, emphasizing the abrupt onset after a dramatic and catastrophic cataclysm, their transient nature, and more expecially their re-appearance under analagous circumstances, on subsequent occasions.

Most neurologists are unwilling, however, to subscribe to this conception of a hysterical basis, and prefer to reserve their opinion as to the nature. Some have invoked a hypothetical "specific" paralysing effect of lightning, organic in type. Schuster, for instance, wrote: "The lightning palsies are specific of electric origin; they represent a symptom which is pathognomonic for lightning." Charcot[15] coined the word "keraunoparalysis" to describe this affection.

Even the psycho-recidives may have a foundation on other than psychological factors: for Hoche and Reichl report a case in which a severe red œdema of an arm always returned a day or two before a thunderstorm.

Hysterical manifestations undoubtedly occur frequently after lightning, and the literature is full of instances. Blindness, deafness and loss of speech are the commonest psychogenic sequelæ, though here again organic disease may be present in some degree in the affected organ. Thus, some conjunctival or uveal damage may lead to intense lachrymation and photophobia, which in turn are succeeded by a psychogenic disorder of function.

Choosing at random from the literature cases of hysteria after lightning-stroke, we may quote the following:—

Daniel Brown, a sailor on H.M.S. *Cambrian*, was struck both blind and dumb by a lightning-stroke while at sea in 1799. (Godfrey, 1822.)

A man of forty-five was struck helpless by a lightning-flash. He was not unconscious, but complained of great pain in the eyes; for seven months he was "blind" from spasm of the eyelids. When finally the lids were forced open he cried out in ecstasy that he saw the light, but added that it gave him such acute pain that it could not longer be borne. In course of time the photophobia disappeared. (Ogle, 1858.)

In addition to the usual transient paraplegia after lightning (keraunoparalysis) and the hysterical disorders, it must be admitted that permanent neurological sequelæ may occasionally arise, testifying to a severe structural affection of the nervous system.

In 1908 an inhabitant of Berlin stood with many others sheltering from a storm; all were struck by lightning, and four were killed. The patient was rendered unconscious and was taken to the Charité Krankenhaus. On recovery, he was paralysed in all four limbs and was aphasic; numerous burns were present. He remained in hospital for nine months, during which time the speech returned but the paralysed muscles began to waste. In 1931 I was permitted to examine this man at the Hufeland Hospital, Berlin, through the kindness of Professor Schuster, who has courteously permitted me to quote the case. Pupillary inequality and facial asymmetry were found; conjugate ocular movements were defective to the left. Arms and legs were wasted, especially distally, and electrical reactions of degeneration was found. The tendon reflexes were sluggish or absent. There was a peripheral distribution of sensory loss over the arms and legs.

Somewhat analogous cases have been reported by Porot,[16] who described a lightning-stroke which hit a group of Serbian soldiers resting under some trees on the Macedonian front in 1916. Three developed neurological sequelæ. One, seen seven months after the accident, showed a spastic paraplegia, with diffuse wasting of the lower limbs and a left-sided Babinski response. There was loss of sensation as high as the seventh thoracic segment. A second showed after six months universal tremor, diffuse muscular atrophy, sluggish ankle jerks, patchy sensory impairment over the lower extremities. The third developed a paraplegia suddenly twenty-four hours after the accident; for one month he was totally helpless. Seen fourteen months later, a spastic paraparesis with pyramidal affection was found, and also a left-sided cataract.

Urechia[17] has reported a case of a man who was struck by lightning while carrying a gun over the left shoulder. On recovering consciousness he felt severe pains in the chest and upper limbs. Weakness, wasting and sensory impairment were demonstrable in the left arm, together with cyanosis and hyperhidrosis. These signs disappeared at the end of three months. A second patient developed suddenly a nerve-deafness in the left ear, following a lightning-stroke.

Psychological sequelæ — other than the post-traumatic hysterias — are not unknown, and a lightning-stroke may be the precipitating factor in the development of a chronic confusional or depressive psychosis.

The following case illustrates a chronic psycho-neurotic state, with paranoid episodes and with curious vaso-vagal attacks, following a lightning-stroke:—

O.H., aged 36, attends my out-patient department at the National Hospital, Queen Square, on account of vaso-vagal turns, general weakness, depression, sleeplessness and inability to concentrate. Her symptoms started sixteen years ago, when she was struck by lightning. She did not lose consciousness, but sight and hearing momentarily left her and she became stiff all over. No permanent neurological abnormality supervened. She was kept under observation for some months, but she ultimately developed a marked paranoid psychosis with delusions of persecution.

Well-known neurological disease of organic type may at times seem to be precipitated by lightning, just as by electrical accident or any other form of trauma. An excellent example of a lightning accident followed almost immediately by the first symptoms of a disseminated sclerosis, has recently been reported by R. S. Allison.[18]

Finally, one may quote those quaint records of the apparently salutary effect of lightning on the course

of intercurrent disease. In this way it resembles any other sudden and dramatic phenomenon. On the night of 8th September, 1915, a German Zeppelin dropped an explosive bomb outside the National Hospital, Queen Square. Although not a pane of glass remained unbroken in the vicinity, not a single person was injured; on the contrary, several patients in the hospital who had been paralysed for months were instantaneously cured. Similar results have been attributed to lightning. Naturally most of the disorders so "cured" are of psychogenic type, but one or two concern chronic maladies of varied and indeterminate kind. A few examples may be quoted from Sestier:—

A woman of 44 years who had been paralysed in arms and legs since the age of 6 was terrified by a furious thunderstorm. At its height her brother knocked on the door, which was locked on the inside. Without waiting to find her crutches she leapt out of bed to admit him, and from that moment was able to move naturally. (Dienerbroeck.)

In 1807 a man who had suffered from left-sided infantile hemiplegia was struck by lightning; on recovering consciousness he regained the use of his affected side, but was thereafter afflicted with deafness.

A clergyman named Winter who had sustained an apoplectic hemiplegia in 1761, was awakened one night about a year later by a terrific clap of thunder. He felt his chest crushed by an enormous weight, but next day his paralysis had completely disappeared. (Wilkinson.)

A chronic arthritic, who for twenty years had been taking the waters at Tunbridge Wells, was instantaneously cured by a lightning-stroke. (Gardane.)

In 1781 lightning struck a small village hospital in the Austrian Tyrol; the next day a hemiplegic was able to get up and walk without assistance. (Troostwyk.)

Scoresby relates that the packet-boat *New York* was struck twice by lightning in the course of nine hours. In a cabin reserved for ladies slept an old man, whose obesity and infirmity rendered him so helpless that he had not walked half a mile in the past three years, and he had not once been on

deck since the voyage started. After the second shock he got out of bed, went on the bridge, and thereafter appeared to have the full use of his limbs. He was at first strange in manner, but this aberration soon passed off.

Dr. Eason of Dublin reports a case of a woman afflicted with a scirrhous carcinoma of the breast who was struck by lightning while sitting at a window. The current hit her chest, scorching her dress. Two days after the accident Dr. Hicks found to his amazement that the tumour was much softer and smaller; a little later it had disappeared altogether.

Lightning was credited with rejuvenating powers during a storm which struck the Church of St. Mark, Roveredo, in 1783. The officiating priest, an old man of eighty-four, was struck, his vestments being burned. But following the accident his strength seemed to be renewed; he walked with much greater elasticity, and was able to read without spectacles. (Troostwyk.)

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THE CARE AND MANAGEMENT OF PREMATURE INFANTS.

BY

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DURING the last few years the care and management of premature infants has acquired additional importance, and has been more extensively studied in all civilized countries. This has been largely due to the widespread adoption of well-organized ante-natal treatment, and considerably more inductions of labour are now performed in the interests of the mother or the child.

Apart from the usual desire to rear a premature infant, however unpromising at birth, various family or domestic reasons may make its survival a matter of supreme importance. The death of the premature infant of an elderly primipara where labour has been induced, shall we say, on account of severe toxæmia, may be in the nature of stark tragedy to its parents. Furthermore, in every case the mother has had perhaps thirty-four weeks of pregnancy to endure, with all its trials and discomforts, and has every reason to expect a live baby as her reward.

It has been alleged by some that the rearing of premature infants is not, from a purely economic or sociological standpoint, worth the enormous amount

of care entailed, and that such infants grow up weak and rather useless individuals, who may eventually become a charge on their fellows. Recent investigations in Germany, however, have shown that premature children, having survived the first few critical weeks, have just as much chance of becoming good workers, thinkers or athletes as any other type of child.

The two most important points in the management of premature infants are, of course, temperature regulation and feeding. The regulation of temperature is the first and constant difficulty. Even the full-time infant's tenacity of life must sometimes be sorely tested, considering the circumstances which not infrequently obtain at its birth during the winter-time. Projected into a chilly room or labour ward, seized and subjected to even dangerous solicitude, its temperature must often fall to an alarming degree, and this at a time when important anatomical changes and delicate metabolic readjustments are commencing. It may also be pointed out that by reason of its own metabolic activities the temperature of the fœtus in utero is 0·5° higher than that of its mother. Small wonder is it, therefore, that numbers of premature infants are certified as dying of "prematurity" or "congenital debility" during the first few days of life, when their deaths were really due to the effects of cold sustained immediately after delivery. Once the temperature has been allowed to fall for even a very short time in the case of a premature infant, it is unlikely that the effects of such neglect can ever be remedied by any later treatment, however thorough. Immediately after delivery, and before the cord is tied, the infant must be wrapped in a warm blanket. Tying the cord and weighing must be accomplished with the utmost dispatch, and the infant is then

wrapped in gamgee, covered with blankets and put into the cot with three rubber hot-water bottles at 160°, or better still with an electric blanket. For hospital or nursing home practice the latter is a very desirable article. It costs about thirty shillings, with an additional six shillings for a waterproof cover, and can be obtained from any surgical stores. It can be used off any voltage and has a regulator switch for three temperatures, 100°, 130°, 160°. The 160° temperature should be used. The electric blanket is free from danger, and should be used arched over the infant between the enveloping blanket and the ordinary covering blankets. Excellent results have been obtained with it at Queen Charlotte's Hospital during the past two years. Immediately after reaching the ward the rectal temperature must be taken with a subnormal thermometer with a low limit of 88°. All other thermometers are quite useless for premature infants. Unless great care is taken an infant may have a rectal temperature of 90° ten minutes after delivery, although wrapped up quickly in blankets. If the infant is below 4 lb. the rectal temperature should be taken 2-hourly by day and night for a fortnight, and 4-hourly if between 4 lb. and 5 lb. It is absolutely essential to keep the temperature between 97° and 99°. Failure to do this must be put down to inefficiency on the part of the nurse. The electric blanket should be kept on at 160° day and night for a fortnight in the case of a very small baby. Good results can be obtained with an ordinary cot and hot-water bottles if sufficient care is taken. The rubber hot-water bottles should be covered with flannel or a layer of blanket.

Below a birth weight of 4 lb. no attempt at oiling or bathing must be made. No premature baby,

whatever the birth weight, should be oiled without the rectal temperature having first been taken and found to be within normal limits, and even then the oiling must be done very rapidly to avoid loss of heat. In the cot the baby should lie absolutely flat with only a soft flat pillow beneath the head. The piling on of many blankets should be avoided, as they may actually weigh down the chest. A hand placed between the blankets and the baby will ensure that the former are not too heavy. Plenty of warm air should be allowed to circulate round the baby's head, over which a bonnet of cotton wool or gamgee is placed. There is a tendency to over-clothing and over-blanketing, and when placed at the bottom of a cot the infants do not get enough air. The baby's position may be changed occasionally by laying it on the opposite side.

No food should be given for the first six hours, then small sips of water, 5 per cent. glucose, or 5 per cent. glucose in saline, should be offered. To avoid dehydration sips of water should also be given between feeds. The amount and frequency of feeds is very important, and experience of extreme variations in feeds recommended in this country and abroad makes it probable that the important factor is not so much the quality as the quantity of the feeds. Gross overfeeding is the common mistake, and many premature infants are killed by too much food. Twelve hours after delivery begin with one drachm feeds 2-hourly day and night, in the case of infants over $3\frac{1}{2}$ lb. Under $3\frac{1}{2}$ lb. give $\frac{1}{2}$ drachm 2-hourly. Increase the feeds very gradually by $\frac{1}{2}$ to 1 drachm daily for the infant over $3\frac{1}{2}$ lb. and by $\frac{1}{2}$ drachm daily for the infant under $3\frac{1}{2}$ lb. The rate of increase must

be determined by watching the effects of the feeds on the infant. On the slightest evidence of cyanosis or refusal to take the whole feed reduce the amount to half and give the feeds hourly for a short time, gradually reverting to 2-hourly feeds next day. Suitable feeds for a baby of $3\frac{3}{4}$ lb. would be :—

Day 1.	1 dr.	2-hourly.	12	feeds.	
,, 2.	$1\frac{1}{2}$,,	,,	12	,,	
,, 3.	2 ,,	,,	12	,,	
,, 4.	2 ,,	,,	12	,,	
,, 5.	$2\frac{1}{2}$,,	,,	12	,,	
,, 6.	3 ,,	,,	10	,,	(omit two night feeds).
,, 7.	3 ,,	,,	10	,,	,, ,, ,,

After seven to ten days the infant can usually be got on to ten feeds daily, and if the weight is less than $3\frac{1}{2}$ lb. ten feeds daily will probably have to be given for a month. If the weight is over $3\frac{1}{2}$ lb., ten feeds daily should be given for two to three weeks, then eight feeds daily.

The exact amount and number of the feeds depends on :—

(1) The birth weight.

(2) How the feeds are taken. If the infant is always hungry and takes well, the amount can often be increased quite rapidly. Refusal of feeds and cyanosis are danger signs.

(3) The weight curve. If stationary after, say, ten days, increase cautiously the amount per feed.

By far the best food is breast milk, and this should always be given when possible, even if only a few drachms of colostrum or breast milk can be expressed during the first few days. The smaller and more premature the infant the more important this becomes. In maternity hospitals, where there is always a good

supply of expressed breast milk available, artificial feeds are rarely given for the first three to four weeks. In private practice every attempt should be made to obtain breast milk for the infant for at least one month.

Failing breast milk, suitable artificial feeds are :—

(1) A modified milk mixture, peptonized. At Queen Charlotte's Hospital the mixture is made as follows :—

Whole milk	10 oz.
Fat whey	10 ,,
Lactose	1 ,,
Cream (50 per cent. fat) ..	½ ,,

This is peptonized for three hours. After two to three weeks the peptonization is gradually decreased by twenty minutes on subsequent alternate days.

(2) Whole milk diluted with an equal quantity of water plus 5 per cent. cane sugar.

Should any of the numerous proprietary articles be used, they should be made up in the proportions recommended on the container; but the amount of the feeds must not be as recommended, but as stated above.

The technique of feeding varies with the birth weight, the general condition of the child and its ability to suck well. The child must not be put to the breast for the first few weeks of life, especially if it is very small. A bottle with a large hole in the teat, a spoon, a medicine dropper, or a nasal catheter may be used. With small premature infants one would generally begin with a medicine dropper or pipette. The infant is not to be taken out of the cot. The hand of the nurse is placed behind its head and back and

the infant gently raised up a little way from the pillow. The feed must be given at the temperature of 100° and given slowly, allowing plenty of time between the sips for the infant to swallow. When strength is gained, and the ability to suck well without getting tired, use a bottle, the teat having a large hole so that the milk flows easily. Should the child be lethargic and suck badly the feeds should be given with a nasal catheter. Rigid asepsis is necessary for this as for all methods of feeding.

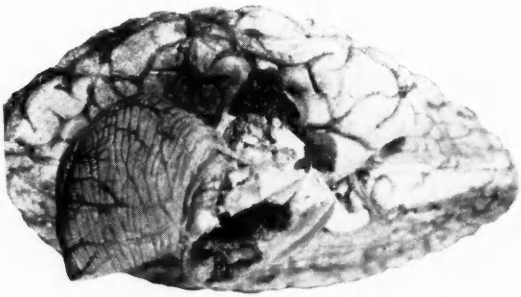
The premature infant is extremely susceptible to infection, and nobody with the slightest sore throat or cold must be allowed near it. In private practice it is better to exclude everybody from the infant's room, and allow only the parents to see the child for a very short time daily for the first month, if it is very small. Should the nurse develop a cold, she should wear a face mask while attending to the child, or —better still—another nurse should take her place until the cold has gone.

The injection of whole blood or serum often saves life, apparently by conferring upon the child those antibodies which it lacks, and this especially applies to the very premature child. Excellent results have been obtained in Germany with this treatment. The blood is given intramuscularly. Any healthy donor may be used, and there is no need to group the blood. On the first day of injection 2 cc. are given, 3 cc. on the third day, 5 cc. on the fifth day, and on each subsequent alternate day give 5 cc. until ten injections have been given. The strictest aseptic precautions must, of course, be taken.

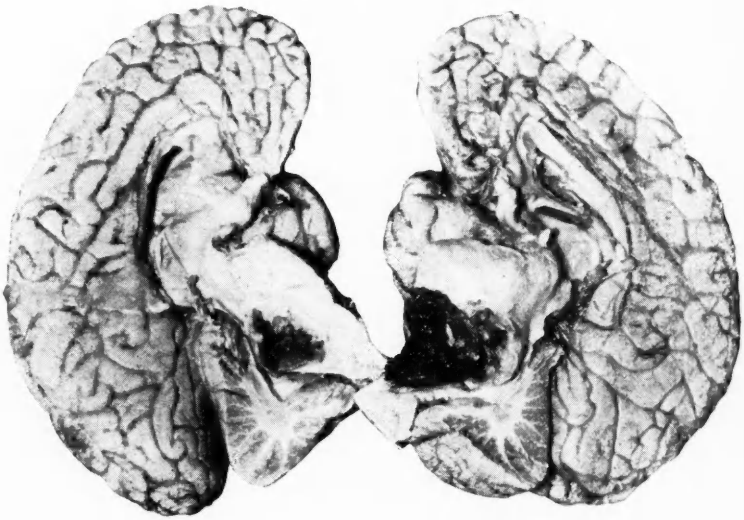
In conclusion, it may be stated that 95 per cent. of the credit for the survival of a small premature infant is due to its nurse, and a great deal has been

accomplished by a nursing staff imbued with sufficient enthusiasm and determination to save even the most unpromising infants. Incredibly small infants have thus survived, and the success of some clinics with premature children weighing between one and two pounds has been remarkable.

PLATE IV



Inferior aspect of right ponto-cerebellar region expanded by tumour from which 7th and 8th cranial nerves issue.



Sagittal section showing tumour site excavating right ponto-cerebellar region.

NOTE ON A CASE OF PONTO-CEREBELLAR TUMOUR IN A GIRL OF SIX YEARS.

BY

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J. W., female, æt. 8½ years, was bright and healthy, but never strong. Whooping cough was the only definite trouble she had suffered till the beginning of February, 1932, when pain started behind the right ear and she held her head turned to the left. She was a patient of Dr. Walshman Ward. There was difficulty in micturition, constipation and irregular vomiting. This last ceased for a few weeks after admission into the Children's Hospital. There she was under the care of Dr. O. C. M. Davis, who kindly invited me to see her and operate.

She was jumpy when she walked into hospital, and for a few weeks her condition suggested chorea. Thereafter cerebral symptoms developed, the child lying quiet but conscious, and always preferring to turn her head to the left. Stupor set in, and vomiting returned in the last week. The tongue was furred, the temperature usually subnormal, and the pulse as often below as above 100. The abdomen was notably scaphoid.

In her last two weeks a left hemiplegia developed with slightly dilated pupil and increased reflexes on that side. Accompanying this there were impaired audition and facial palsy on the opposite side. The optic discs and fundi were found normal by Mr. Garden, and three examinations of cerebro-spinal fluid by Professor Walker Hall proved negative, including the Wassermann reaction. There were 36 mgs. of urea per 100 c.c. of blood, and the urine remained normal.

Conclusions.—Crossed paralysis present, due to right-sided tumour pressing on the right cranial nerves, and the left pyramidal tract above its decussation.

Operation.—On 18th April, 1932, an extensive right-sided decompression was performed, and obvious pulsation of the dura was noted. 10 c.c. of clear cerebro-spinal fluid (subsequent report normal) were aspirated from the right lateral ventricle. Her condition improved, but I did not feel further exploration warranted at the time, and the child died the following morning.

Post-mortem.—Revealed a cyst of the size of a pigeon's egg in the right cerebello-pontine region. The facial and auditory nerves appeared to run out of it, and as the pons was hollowed out markedly, it may perhaps best be designated a ponto-cerebellar tumour. It consisted mainly of dark greenish-grey semi-fluid contents. Apparently necrosis and hæmorrhage had occurred.

Biopsy.—The special rapid examination of the specimen showed the presence of old and recent hæmorrhages, associated with neoplastic changes known formerly as "Angiosarcoma."

Remarks.

It is interesting, quoting from Critchley,[1] to note that while brain tumours are relatively rare in childhood, about 50 per cent. are subtentorial in position, and pontine tumours characteristically do not produce papillœdema. Although such a tumour is not amenable to excision owing to its site in the brain stem, the contents could have been sucked out—as advocated by Sargent,[2] with possible relief of symptoms.

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PROVINCIAL MEDICAL JOURNALS.*

BY

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In the provincial towns of England purely local medical journals have not been either numerous or successful. The history of Scottish and Irish medical journalism is outside my province; but it should be recalled that in 1774 a Society of Physicians in Edinburgh started the Medical and Philosophical Commentaries modelled on the Commentarii de rebus in scientia naturali et medicina gestis that was published in Leipzig from 1752 to 1794. From these commentaries of the Edinburgh physicians sprang (in 1805) the Edinburgh Medical Journal, which is still flourishing among us. I find that in the early days of the Edinburgh Journal provincial correspondence from practitioners in England was encouraged. Bristol was represented by a Dr. Dickson, F.R.C.P.Ed., F.R.S.Ed., and L.S., who after serving in the Royal Navy, and holding the office of Physician and Inspector of the Fleet on the North American Station, in his retirement became physician to the Clifton Dispensary. His last communication to the Edinburgh Medical Journal was made in 1821.

The Society of Physicians in London, the first of the medical societies in London, was founded in 1752,

* Paper read before the History of Medicine Section of the British Medical Association at the Centenary Meeting in London, 1932.

and issued between 1776 and 1784 six volumes of Medical Observations and Inquiries by a Society of Physicians in London.

Sir William Wilde, writing in the first number of the Dublin Quarterly Journal of Medical Science (1846), remarked that periodical literature was the natural offspring of learned and debating societies, and he noted that in Ireland several medical journals were published and ceased to exist between the years 1817 and 1830. He considered that this activity was due to the fact that after the peace of 1815 "learning, science and the arts again upreared their heads."

Craik speaks of three great sun-bursts in our literature, the Elizabethan Age of dramatic and other poetry, the Augustan Age of Anne, and a third which ushered in the nineteenth century.

I have asked the opinion of Mr. Arrowsmith-Brown, and he replies: "There was no one advance in the craft of printing which would account for 1820 being the starting-point of so many journals, although printing was making more rapid progress towards cheapness and big output than ever before." One can only say that this was a contributory factor, and probably of far less importance than the general renaissance of science, for he thinks that the end of the long French Wars must have brought a revival of printing similar to that which has followed the recent War.

There was, however, another factor, mentioned by Kirkpatrick in the centenary number of the Irish Medical Journal: "Medical teaching became a profitable occupation, and the competition among the teachers quickly led to an increased activity in the study of medicine in the Irish capital. The example of both England and Scotland had shown that a much

greater publicity was to be obtained by periodical publications than by pamphlets, and publicity was essential for the attraction of pupils. Furthermore, short papers and notes of cases could be much more readily issued in a medical periodical, and at a much smaller cost than in separate papers."

At present there are five provincial medical journals published which may be considered to be purely local. By this I mean to exclude such journals as the Journal of Hygiene and the British Journal of Psychology published at Cambridge, the Quarterly Journal of Medicine at Oxford, the Bio-Chemical Journal at Liverpool, and the Medical Annual and the British Journal of Surgery at Bristol.

These five journals, which I will place in order of seniority, are published in Liverpool, Newcastle, Birmingham, Bristol and Leeds.

Liverpool. — The Liverpool Medico-Chirurgical Journal has a long and distinguished record. Its first volume contained an admirable history of medical affairs in that city, and it is related that three medical journals have been published there, the Liverpool Medical Gazette and the Liverpool Medical Archives edited by Dr. Hunter Lane in 1833, and the Liverpool Medical Journal in 1834, but the author adds: "Neither continued more than a year."

Since then there have appeared the Liverpool (Hospital) Medical and Surgical Reports, which lasted from 1867 to 1871, and also the Liverpool and Manchester Medical and Surgical Reports, from 1873 to 1878, and Clinical and Pathological Reports of the Royal Infirmary, Liverpool.

I do not know where I should mention some other important journals published in Liverpool, but they

ought not to be lost sight of, the Annals of Tropical Medicine and Parasitology and the Memoirs of the Liverpool School of Tropical Medicine.

The Liverpool Medico-Chirurgical Journal is the official organ of the Liverpool Medical Institution. In 1857 the Proceedings of the Liverpool Medical Society were incorporated with it, and in 1881 it absorbed and continued the Liverpool and Manchester Medical Reports. In 1916 the exigencies of the War brought about a suspension of publication, but in 1929 it was happily revived under the Editorship of the late Dr. R. W. MacKenna, and its present editor is Dr. Robert Coope.

Newcastle provides us with the Newcastle Medical Journal, which traces its origin to the Transactions of the Northumberland and Durham Medical Society, which were published as an annual volume from 1848 to 1892. In 1892 this society in conjunction with the Northumberland and Gateshead Pathological Society started a new monthly journal called the Northumberland and Durham Medical Journal, which appeared from 1892 until 1914. Unfortunately, the activities of the Society were suspended from 1914 to 1919 and the Journal was discontinued. In 1920 the Northumberland and Durham Medical Society, having resumed its activities, amalgamated with the Newcastle-on-Tyne Clinical Society, and the journal was revived under the title of The Newcastle-upon-Tyne and Northern Counties Medical Journal. This title was abbreviated in 1926 to that of the Newcastle Medical Journal, which journal still appears under the auspices of the Newcastle-upon-Tyne and Northern Counties Medical Society, and is edited by Dr. J. C. Spence.

Birmingham has a much less complicated history. The Birmingham Medical Review appeared monthly from 1872 to 1918. In 1901 a Midland Medical Journal was also published in Birmingham, but this was incorporated subsequently with the Medical Review. It is to be regretted that after surviving the earlier years of the War the Birmingham Medical Review had to give up the struggle in 1918, but it was happily revived in 1926 under the editorship of Dr. A. P. Thomson, who has been succeeded by Dr. P. C. Cloake. The Birmingham and Midland Counties Pathological Society published annual reports from 1842 to 1852.

Bristol.—The Bristol Medico-Chirurgical Journal is the only one that has ever been started, and I shall refer to it again later.

Leeds had never had a local medical journal until a year ago. In February, 1931, stimulated by the Centenary of the Medical School, the University of Leeds Medical Society brought out a medical journal under the title of The University of Leeds Medical Society Magazine, which will also incorporate the proceedings of the Leeds and West Riding Medico-Chirurgical Society. The Chairman of the Editorial Committee is Mr. L. R. Braithwaite, F.R.C.S., whose forebears maintained a Retrospect of Medicine well known to most of those who have any long experience in practice. It promises to be a really good journal, and in its early numbers an excellent history of medicine in Leeds is given.

Brighton.—I have just received the 85th Annual Report and the Proceedings of the Brighton and Sussex Medico-Chirurgical Society, a vigorous institution established in 1847, which publishes annually at full length the papers read at its meetings.

Reading.—Similarly the Transactions of the Reading Pathological Society are published annually.

Sheffield.—I cannot do better than quote from a letter written to me on 13th July, 1932, by Professor A. J. Hall :—

MY DEAR NIXON,

There is no medical journal published in Sheffield at the present time. The facts about the old Sheffield Journal are as follows :—

It was begun in 1893 as the Sheffield Medical Journal, and after two years the title was changed to the Quarterly Medical Journal for Yorkshire. As such it continued until 1902, when it ceased. For the first seven years Snell was the editor. He was succeeded in 1899 by Christopher Addison, who was at the time Professor of Anatomy (and has since held various Cabinet ministries), and I was editor during its last two years. It ceased because it was not sufficiently supported, and was deemed to serve no useful purpose.

Manchester.—Professor Telford has replied to my inquiries : " We have, I am sorry to say, no serious medical journal originating in Manchester." He sent me, however, a list of publications which had in times past come from that city : Manchester Obstetric Journal, published by the Manchester Medico-Chirurgical and Obstetric Society ; Report of the Manchester Medical Society ; Archives of the Public Health Laboratory of the University of Manchester ; British Record of Obstetric Medicine and Surgery (1848–9) ; Manchester Medical and Surgical Reports, incorporated with Liverpool (1870–1) ; Medical Chronicle.

Leicester has been responsible for two journals, the Provincial Medical Journal (1840–50) and the Midland Medical Miscellany and Provincial Medical Journal. At present no journal is published in Leicester.

Hull.—Transactions of the Hull Medical Society were published at irregular intervals between 1919 and 1924.

Newcastle-under-Lyme.—Report of the Proceedings of the North Staffordshire Medical Society appeared for 1857–8.

THE BRISTOL MEDICO-CHIRURGICAL JOURNAL.

In 1882 Greig Smith, a surgeon of outstanding ability and prescient far beyond the limits of the branch of the profession he practised, launched and edited The Bristol Medico-Chirurgical Journal. It originated from the publication for two years of an Annual Report of the Transactions of the Society. There has been no rival journal in Bristol nor any interruption during the War in the regularity of its appearance. Unlike others, the determination of the then editor, Dr. Patrick Watson-Williams, carried it through its difficulties, and instead of shrinking in size I find in an editorial note of 1916: "This issue is our second and enlarged special number, and may be correctly described as a War Number, inasmuch as all the original articles have special reference to the War, and with one exception (are) by writers who deal with their work in Military Hospitals at home or abroad." Instead of languishing, The Bristol Medico-Chirurgical Journal received distinct stimulus during the years of the War, but by the end of 1919 the increased cost of production threatened the journal with suspension; but the members of the Society

supported the journal with practically the whole proceeds of their subscriptions, they even raised their subscription by fifty per cent. to keep it going. It may well be asked what induced them to such efforts. Was the journal worth keeping alive? The reasons, I believe, that actuated our Society were these, and they may well stand as the justification of other journals than our own, and may, some or all of them, induce other provincial towns to establish local journals:

The journal gives opportunities for recording observations of cases that would be crowded out of the larger general medical periodicals, or would be unacceptable to the specialized periodicals.

It stimulates medical men of the district to record much that might otherwise be lost, and to prepare their communications with greater precision and accuracy, since they will be afterwards published.

It is invaluable for maintaining a Medical Library, since all books received for review go into the Library as well as all exchange periodicals. The Medical Library of the Society was presented in 1925 to the University of Bristol, and in exchange for this great gift, with the promise of all review books and exchange periodicals, the University houses the Society rent-free and grants the use of the University Medical Library to all members of the Society in perpetuity.

Finally, a local journal forms a mirror of the activities of the medical men practising in the district, it records passing events in such detail as to furnish the sources of history to chroniclers of the future, and in its obituary notices it preserves the memories and stories of the lives of those who have worked amongst us and have laid the tradition which we who follow may well aim at preserving and whose deeds we may strive to emulate.

Reviews of Books

An Index of Treatment. By VARIOUS WRITERS. Tenth Edition. Edited by ROBERT HUTCHISON, M.D., F.R.C.P. Pp. xviii., 1,027. 93 illustrations in the text. Bristol: John Wright & Sons Ltd. 1931. 42s.—Hutchison's *Index of Treatment* is too well known to require any recommendation. The tenth edition has recently appeared, and contains many valuable additions, particularly "Diabetes in Childhood," by George Graham, although the author is, in our opinion, inclined to restrict carbohydrates too much. "Pink Disease" or "Acrodynia" is dealt with by Donald Paterson, whilst "Protein Shock" is briefly and clearly described by Sir Thomas Horder. Some articles have been rewritten, notably that on the treatment of empyema, an excellent résumé of modern surgical procedures, which only figures in the index under the heading of "Pyothorax," although in the text it is placed under the "E's." But it is sufficient to say that the new edition of Hutchison's *Index of Treatment* is as indispensable to every practitioner as the earlier editions.

A Synopsis of Surgical Anatomy. By ALEXANDER LEE MCGREGOR, M.Ch. Pp. xiv., 609. 606 Illustrations. Bristol: John Wright & Sons, Ltd. 1932. Price 17s. 6d.—This book hails from South Africa, and deserves well of us if for that reason only: it claims to be the first-born of the Medical Department of the University of the Witwatersrand. It is a formidable publication of over 600 pages, and is complete with preface, foreword and introduction. We question whether this is not tending to frighten off the student from the study of an ancillary subject, of great importance though it admittedly is, when his time is so fully occupied with clinical study. It seems to us that the tendency to overdo the pure anatomy to the exclusion of the more distinctly applied part of the subject tends to defeat the laudable object with which such books are written. No one ever wrote a more readable and valuable book on this subject than Treves, an anatomist as well as a surgeon, and he introduced many an apt clinical detail to emphasize the point he would make. It made his book an excellent bridge between anatomy and surgery, and emphasized the value of the former in a most practical way.

In this book there is a division into two almost exactly equal parts of the anatomy of the normal and of the abnormal. Both are good, the latter excellent, so much so that we should like to see the first part omitted altogether. It is practically pure anatomy, and not what a student in his clinical years wants, or will find time to read. The second section is exceedingly good, full of sound anatomy served up in an appetizing and useful form. It may be warmly commended to anyone who wants to retain what is useful in all the anatomy he has learned and to learn how to make the best use of his knowledge in acquiring clinical acumen. The very numerous illustrations are clear and well chosen and the index is adequate.

Handbook of the Vaccine Treatment of Chronic Rheumatic Diseases. By H. WARREN CROWE, D.M. Second Edition. Pp. ix., 79. London: Oxford University Press, 1932. Price 3s. 6d.—The treatment advocated in this handbook is based on the hypothesis (it can hardly be called more) that a strain of skin staphylococcus, named by the author Micrococcus Deformans, plays a predominant part in the production of the condition known as rheumatoid arthritis, and that various streptococci of alimentary type have an equally important share in causing fibrositis and osteo-arthritis. One main purpose of the book is to contend that an autogenous vaccine is not absolutely necessary, but that satisfactory results can usually be obtained by the use of a "stock" vaccine. The dosage recommended is in all cases small, and improvement has been observed in several patients to follow the administration of no more than 100 streptococci plus 100 staphylococci: since the stock streptococcal vaccine contains 155 different strains, it would therefore seem that the subcutaneous introduction once a week of, at most, one streptococcus of the strain responsible for the illness might be all that is necessary.

National Health Insurance. By G. F. MCCLEARY, M.D. Pp. x., 185. London: H. K. Lewis & Co. Ltd. 1932. Price 6s.—This little book gives a most interesting account of the origin and growth of National Health Insurance in this and other countries. It contrasts the various methods adopted by different states, and discusses very concisely the advantages and disadvantages of their characteristic features, and how well (or otherwise) they work; also their effect on the populace, the medical profession, the Treasury and Friendly Societies. On page 132 is a good story about "Christmas Fever"—a

raging epidemic, confined to insured persons, starting in the middle of December and terminating—always favourably—on the Monday after Epiphany. There is a valuable international bibliography.

The Legal and Ethical Aspects of Medical Quackery. By L. LE MARCHANT MINTY, Ph.D. Pp. xviii., 262. London: William Heinemann, Ltd. 1932. Price 7s. 6d.—This very engaging volume of some 260 pages, though packed with excellent material, is, on the whole, rather easier to read than to review. Perhaps the first criticism that occurs to one is that the text is happier than the title. Dealing as it does so much with orthodox medicine, it might well have been called "The Law in Relation to Medical Practice," and it could certainly be read with much profit by any recently-qualified man. Here and there, of course, the contents betray the layman, as on page 23, for instance, he infers that chloroform and ether come into the schedules of the Dangerous Drugs Act, and in the first chapter he seems to be unaware that there is a M.R.C.P. (Lond.) as well as the Fellowship and Licentiate. His views that Fellows of the Royal College of Physicians could sue for their fees under some other diploma has the merit of novelty, and I commend it to those of my medical colleagues so qualified who feel themselves handicapped in this way. In conclusion, one may say that this volume breaks new ground, and its wealth of information should make it an important addition to the bookshelves of every practitioner.

A System of Surgery. By C. C. CHOYCE, C.M.G., C.B.E., M.D., F.R.C.S. Third Edition. Three volumes. Illustrated. London: Cassell & Co. Ltd. 1932. Price £6.—Choyce's *System of Surgery* needs no introduction to the profession, with whom it has been deservedly popular since its first publication in 1911. In the present edition fourteen new contributors make their appearance, while some of those previously contributing have dropped out. All the articles have been extensively revised or rewritten in the light of recent knowledge. There is, for example, an entirely new article by Mr. Birkett upon the uses of radium, while those dealing with the surgery of the parathyroids and of the sympathetic system have been brought fully up to date. Mr. Groves provides an excellent chapter upon fractures and Mr. Wilfred Trotter's thoughtful and original contributions dealing with the surgery of brain and cord have been revised by Mr. Julian Taylor.

The printing is as good as ever and numbers of fresh illustrations have been added. Mr. Choyce and his collaborators are to be congratulated upon having carried out a difficult task in a highly satisfactory manner.

A Short Practice of Surgery. By HAMILTON BAILEY, F.R.C.S., and R. J. MCNEILL LOVE, M.S. Vol. II. Pp. vii., 531–1005. Illustrated. London: H. K. Lewis & Co. Ltd. 1932. Price 20s.—It is a question whether Bailey and Love, who wrote this second volume of their *Short Practice of Surgery*, or the students who will read it are the more to be envied. Certainly the work is a marvel among medical text-books and represents as great an advance in teaching the subject as modern operative technique does in practical achievement. It covers the surgery of the chest, abdomen, head, central nervous and integumentary system. The best surgical procedures known to-day, whether just out or time honoured, are the only ones included. The same applies to the descriptions and classification of surgical diseases. As a result of this dexterous selection and simplification of the voluminous literature of the day, a student now, for the first time, can well and truly encompass the whole realm of general surgery in the short years which the teaching curriculum allows. For not only are there delightful lucidity of language and pleasing style, but also splendid, memorable illustrations, and beautiful and faultless letterpress. It is a common complaint of the whole wide range of the surgical text-books that, though any one may excel in some features, they fail miserably in others and leave the student dissatisfied. But in this compendium is realized the student's dream of a book that leaves nothing out which he wants to know. More than that, the method of arrangement of the text and the comprehensive lists of affections of different organs make the well-packed information most easily assimilable. No surgical guide contains such encyclopedic information nor displays its contents with such marvellous intelligence.

The Injection Treatment of Varicose Veins, Hæmorrhoids and other conditions. By R. H. MAINGOT, F.R.C.S. Pp. ix., 100. London: H. K. Lewis & Co. Ltd. 1932. Price 4s.—On the latest publication on injection treatment Mr. Rodney H. Maingot is to be congratulated. His new book, *The Injection Treatment of Varicose Veins, Hæmorrhoids, and other Conditions*, not only contains the latest but also the best practical information on this expanding field of therapy.

It is an admirable guide to various methods and a safeguard against pitfalls. The need is emphasized for a preliminary general, as well as a local, examination of the patient proposed for injection. The list of contra-indications is particularly valuable for beginners in the treatment. A novel method for dealing with saphena varix in the groin is described, called "twin injection," which is also efficacious for resistant veins. That urticaria may ensue in the use of sodium morrhuate is news to the reviewer, and a valuable warning. The Dickson Wright method of treating varicose ulcers is clearly recounted, and his views on the defective venous hydraulics underlying the condition explained. The two chapters on injections for hæmorrhoids and for obliterating troublesome synovial and serous sacs fully informs readers desirous of giving such methods a trial.

Diseases of the Nose, Throat and Ear. Edited by A. LOGAN TURNER, M.D., LL.D. Third Edition. Pp. xxvi., 465. Illustrated. Bristol: John Wright & Sons, Ltd. 1932. Price 20s.—This is easily the best text-book on the subject, both for student and for practitioner, and the third edition maintains the high standard of its forebears. We offer it, therefore, a full and hearty welcome, and it is in no carping spirit that we venture one criticism. The space devoted to major operations is wasted: few of the readers will ever perform one. And there is beginning a tendency even more disastrous in books than in men—with age comes obesity.

The Principles and Practice of Otology. By F. W. WATKYN-THOMAS, F.R.C.S., and A. LOWNDES YATES, M.C., F.R.C.S. Pp. xii., 555. Illustrated. London: H. K. Lewis & Co. Ltd. 1932. Price 25s.—This book will be read by all otologists: it is doubtful whether it will appeal to others, and perhaps this is as well, as the authors are inclined to present their own opinions as accepted doctrine. It consists of a series of extremely interesting essays on otological subjects, principally the investigation of types and degrees of deafness and their graphic representation; the pathology of aural disease; and details of operative technique. There is much that is new (including the construction "Guttæ pro auris") or is considered from a new angle, though the authors sometimes claim as their own what has been long established, for example, that the upper limit of audible tones descends with advancing age. Some of the omissions are hard to understand:

skiagraphy is mentioned in the diagnosis of foreign bodies, but not in connection with otitis media ; aural ionisation and parathyroid in the treatment of otosclerosis are both mentioned but not described. To each chapter is appended a valuable bibliography of recent literature. There are 70 plates, well chosen and beautifully reproduced, the great majority from otological and anatomical publications ; over 50 audiographic charts, and nearly 100 diagrams and sketches, of which latter many fail to reach the general standard of excellence. The index is adequate.

Recent Advances in Pathology. By G. HADFIELD, M.D., and L. P. GARROD, M.B. Pp. x., 392. Illustrated. London: J. & A. Churchill. 1932. Price 15s.—This addition to the "Recent Advances Series" is especially welcome at the present time, since it affords a ready means of ascertaining the more practical results of pathological research during recent years. Hitherto it has been almost impossible for the clinician to unearth from masses of detail in scattered journals any tangible evidence of pathological opinion on any given subject. The authors have succeeded in a most conspicuous manner in presenting a volume containing a careful and authoritative résumé of pathological research contributing to the better understanding of the causation and effects of disease processes. The first six chapters form an excellent epitome of work accomplished on the reticulo-endothelial system and cancer research, and constitute a well-balanced corrective to the many erroneous views which have acquired undeserved publicity. The cardiovascular system is dealt with concisely, and our knowledge of essential hypertension is carefully scrutinized. Bright's disease and renal œdema have received considerable attention with the result that the pathological and clinical aspects are brought into a more reasoned relationship. Stewart's work on peptic ulceration receives due recognition. The chapter on the ductless glands includes recent discoveries on the relationship of the parathyroids to certain skeletal diseases, and envisages important advances in our knowledge of the supra-renals and the treatment of Addison's disease. Underlying the whole book one can discern a clinical acumen of undoubted quality which cannot fail to enhance academic pathology.

Editorial Notes

Death of Dr. Carey Coombs.

THE sudden death of Dr. Carey Coombs has deprived the *Journal* of its Assistant Editor. His services in this capacity have been invaluable. He had had long experience as Editor of the *Medical Annual* before he joined the Editorial Committee of this *Journal* in 1919; he became Assistant Editor in 1926. His diligence and judgment in obtaining original articles for the *Journal* added greatly to its interest, and his wide knowledge of medical journalism in general was always at its service. He was a genial and helpful colleague, whose loss is very widely deplored, and by none more than his fellow-workers on the Editorial Committee of this *Journal*.

* * * * *

Medical Dinner.

THE Annual Medical Dinner was held on Thursday, 8th December, at the Clifton Zoological Gardens, Mr. C. Ferrier Walters being in the Chair. The guest of the evening was Dr. J. R. Charles, Consulting Physician to the Bristol Royal Infirmary. The attendance was unusually large and included a great number of Dr. Charles's former clinical clerks, whose enthusiasm gave evidence of their cordial regard for him. The Dean (Professor Fawcett) gave notice of some arrangements for the Centenary Celebrations, the details of which follow.

Centenary of the Medical School.

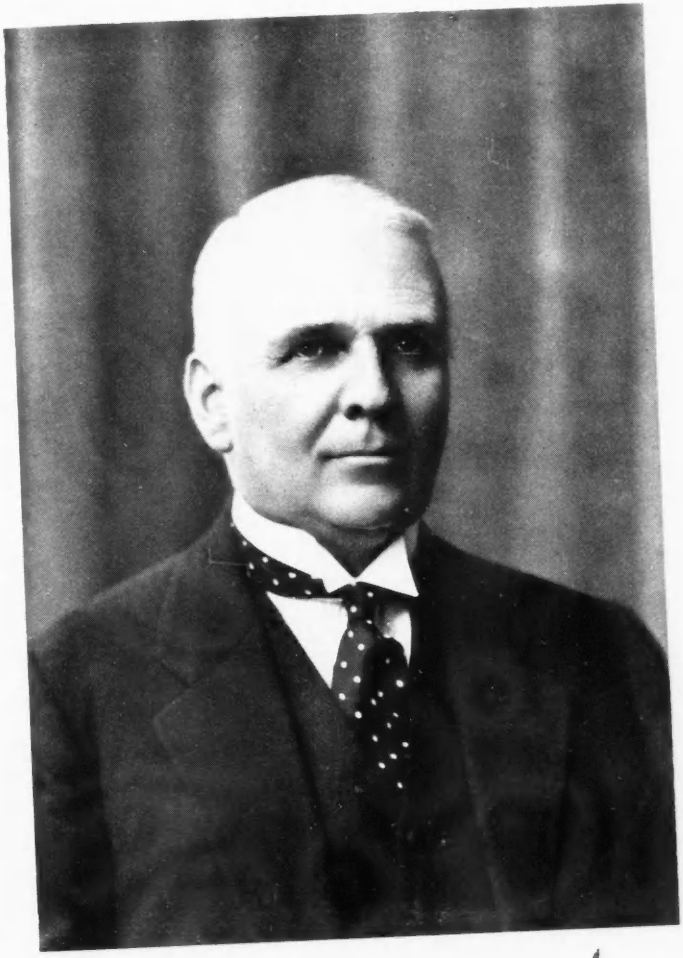
THE Medical School of the University of Bristol will celebrate its Centenary on 30th June and 1st July, 1933. A provisional programme has been arranged which will include, on the afternoon of the first day, receptions at the Bristol Royal Infirmary and Bristol General Hospital, in the evening a dinner of present and past students and guests, to be followed by a reception at the University, and on the second day a combined graduation ceremony of ordinary and honorary graduands, followed by a luncheon. A more detailed statement will appear later.

Obituary

DR. CAREY FRANKLIN COOMBS.

WE have to record with the deepest regret the death of Dr. Carey Coombs. He passed away in the General Hospital on 9th December, after an illness of some five weeks' duration. It will be remembered that he was taken ill suddenly in the street at the beginning of November. Though he appeared to make favourable progress, it was realized by those in attendance that his condition was very grave and that the chances of recovery were remote. The end came suddenly and as a great shock to his many friends.

With the passing of Carey Coombs Bristol has lost a great man and the world of medicine a great physician and teacher. Our first feeling is a sense of irreparable loss ; but surely we may find inspiration and encouragement in the reflection that Coombs lived—yes, lived every moment of his life—and



Carey A. Coombs.

has left us a lasting memorial. His work for medical science lives on and will endure. His contributions to medical literature will rank among the classics of cardiology. His book, *Rheumatic Heart Disease*, and his Lumleian Lecture on "Cardiovascular Syphilis" are contributions to medical knowledge which will not readily be superseded. At the time of his death he was engaged in an extensive research on "Heart Disease." Under the auspices of the Harmsworth Memorial Trust he was conducting an inquiry into the ætiology and prevention of ulcerative endocarditis. Coombs quickly realized that the problems presented by ulcerative endocarditis itself were well-nigh hopeless, and that prevention could only be achieved by tackling the disease at its source, that is to say, by preventing simple endocarditis. He had collected a wealth of material which was due to appear shortly in book form. It is hoped that the work may yet be carried through to completion.

Carey Coombs lived at high pressure always. How he got through the amount of work he did was a source of amazement and no little anxiety to his colleagues. Although he conducted a large and successful consulting practice, it may truthfully be said that his heart was in his hospital and scientific work. In later years high academic distinctions poured in upon him. A detailed account of his career is one record of achievement. He was born in 1879 at Castle Cary, Somerset, the son of Dr. Carey Pearce Coombs, of Frome. As a student he was educated at the Bristol University College and St. Mary's Hospital, London. At the latter he gained the General Proficiency Scholarship and Cheadle Medal. He qualified with the M.B., B.S. in 1901, taking honours in Medicine and Obstetrics; he took the M.D. 1903, M.R.C.P. 1908, and F.R.C.P. 1917. At St. Mary's he held numerous house appointments, including that of Medical Registrar. Later he came to Bristol as Registrar to the Children's Hospital. In 1907 he became Assistant Physician at the Bristol General Hospital. In 1920 he became full physician. In recent years he filled many other roles. In 1926 he became

Assistant Editor of the *Bristol Medico-Chirurgical Journal*, 1925 he delivered the Long Fox Lecture, 1927 the Chadwick Lecture, and the Lumleian Lecture in 1930. At the time of his death he was a Councillor of the Royal College of Physicians. In 1930 he was elected President of the Bath and Bristol Branch of the British Medical Association.

During the war Coombs had a long record of faithful service in Mesopotamia, in France, and in England towards the end of the war. In Mesopotamia he contracted a serious illness, which may have been a factor determining his more recent breakdown and premature death.

As a colleague and friend Coombs will be greatly missed by all who knew him, and he will ever be remembered with the sincerest affection. He was an incurable optimist, full of vitality and energy. He appeared to have an insatiable capacity for formulating schemes for the organization of research and medical services of the City. He was one of the chief promoters of the New Hospital at Winford, and founded a large cardiac clinic in association with the Education Committee.

During the last few weeks of his life a great part of his time was spent in making plans for the future. He realized how greatly his activities would have to be restricted, but it was his hospital and research work which he placed in the foreground, and he was always intolerant of suggestions which involved any curtailment of these activities.

It is certain that no one can fill the gap that is left by the loss of Carey Coombs, but the best tribute that we can pay to his memory is to see that some at least of the work in which he was so deeply interested is carried on.

H. H. C.

Meetings of Societies

Bristol Medico-Chirurgical Society

SESSION 1931–32.

THE Annual General Meeting was held in the Physiological Lecture Theatre of the University on Wednesday, 12th October, 1932, at 8.30 p.m.

Dr. J. R. Charles was in the Chair, one hundred and five members being present.

The minutes of the previous meeting were read and confirmed.

One candidate, whose name was proposed and seconded at the previous meeting was elected to the membership of the Society.

Five candidates were proposed for election to the membership of the Society.

The President, Dr. J. R. Charles, then resigned the Chair to his successor, Mr. E. W. Hey Groves.

Dr. P. Watson-Williams proposed a vote of thanks to Dr. J. R. Charles for his services during the past year; this was seconded by Professor Rayner and carried with acclamation, and Dr. Charles replied.

Mr. E. W. Hey Groves then gave his inaugural address entitled: **"A Surgical Adventure."**

Mr. C. F. Walters proposed a vote of thanks to the President for his address; this was seconded by Mr. Duncan Wood and carried unanimously.

The Hon. Secretary and Hon. Treasurer then gave their reports, and the Editor of the *Journal*, Professor J. A. Nixon, then gave his report and spoke of the history of the *Journal*.

Dr. Elwin Harris (senior) was elected to the office of President-Elect on the proposition of Professor A. Rendle Short, seconded by Dr. Carey Coombs.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

INCOME AND EXPENDITURE ACCOUNT for the year ended 30th September, 1932.

INCOME.	£ s. d.	£ s. d.
Members' Subscriptions ..	228 18 0	
Do., outstanding for 1931–1932	59 17 0	
		288 15 0
Interest on Bank Deposits		3 9 6
Interest on £500 4 per cent. Consolidated Stock, less tax		14 15 0
Balance, being excess of Expenditure over Income for the year carried to Balance Sheet		6 4 0
		£313 3 6

EXPENDITURE.	£ s. d.	£ s. d.
Grant to *The Bristol Medico-Chirurgical Journal*		250 1
Librarian—Honorarium		15 0
Miscellaneous Expenses—		
Goodway–Refreshments	16 16 0	
Postages and Sundries	9 9 11	
Printing and Stationery	9 7 0	
Audit Fee	2 2 0	
Lantern and Cinematograph at Meetings ..	4 4 0	
University Marshal ..	1 0 0	
Lewis's Medical and Scientific Library—		
Subscription 4 4 0		
Postages .. 0 19 3		
	5 3 3	
		48 2
		£313 3

BALANCE SHEET as at 30th September, 1932.

LIABILITIES AND CAPITAL.	£ s. d.	£ s. d.
Sundry Creditors		105 18 2
Capital as at 30th Sept., 1931	686 5 6	
Less Deficit on Income and Expenditure Account as above ..	6 4 0	
		680 1 6
		£785 19 8

ASSETS.	£ s. d.	£ s.
Cash at Bank—		
Current Account	127 17 2	
Deposit Account	160 16 6	
		288 13
£500 4 per cent. Consolidated Stock at cost		437
Sundry Debtors—		
Members' Subscriptions for 1931–1932 outstanding ..		59 17
		£785 19

Audited and found correct,
H. E. KEELER,
Chartered Accountant
Auditor.

16-18 CLARE STREET, BRISTOL,
10*th October*, 1932.

Mr. Carwardine proposed and Mr. G. B. Bush seconded the re-election of Mr. H. L. Shepherd as Hon. Secretary.

Dr. Corfield proposed and Dr. Herbert Rogers seconded the re-election of Mr. A. E. Iles as Hon. Treasurer.

Dr. Geo. Parker was unanimously re-elected as Hon Medical Librarian on the proposal of Mr. Chitty, seconded by Dr. Dix.

Dr. G. Parker, Mr. Hey Groves and Dr. Symes were elected to serve on the University Medical Library Sub-Committee, on the proposal of Dr. Carleton, seconded by Dr. Perry.

Mr. A. E. Iles proposed and Dr. Richard Clarke seconded that the following addendum should be made to Law 7: "That the name of any member whose subscription is three years in arrears shall be removed from the list of members."

The Society's Annual Dinner was then discussed, and it was proposed by Mr. C. F. Walters and seconded by Dr. Richard Clarke that this should take place in March, 1933.

The second meeting of the session was held in the Physiological Lecture Theatre of the University on Wednesday, 9th November, 1932, at 8.30 p.m. Mr. E. W. HEY GROVES in the Chair, and eighty-six members present.

The minutes of the previous meeting were read and confirmed.

Dr. WANSBROUGH and Dr. HERBERT ROGERS showed respectively X-rays and specimens.

The PRESIDENT proposed and it was carried unanimously that Dr. J. A. Nixon should be elected as the Society's representative to serve on the Conjoint Committee of Epsom College.

Dr. MACDONALD CRITCHLEY read a paper on **"The Effects of Lightning"** (reported on page 285), which was afterwards discussed.

The Medical Library of the University of Bristol,

WITH WHICH IS INCORPORATED

The Library of the Bristol Medico-Chirurgical Society.

The following donations have been received since the publication of the list in September, 1932.

November, 1932.

British Medical Association (1)	1 volume.
V. B. Green-Armytage, Esq. (2)	1 ,,
Professor E. W. Hey Groves (3)	7 volumes.
Dr. A. Lumière (4)	1 volume.
Dr. T. Milling (5)	1 ,,
Dr. C. Bruce Perry (6)	1 ,,
Royal College of Surgeons of England (7) ..	1 ,,
Western Theological Seminary, Illinois, U.S.A. (8)	1 ,,

Unbound periodicals have also been received from Professor E. W. Hey Groves and Dr. Carey F. Coombs.

A collection of pamphlets in fifty-eight volumes on "Head Muscles," together with miscellaneous works were presented by Professor F. H. Edgeworth.

Collections of miscellaneous medical works were received from Dr. A. F. Blagg and Dr. W. Alexander Smith.

THE ONE HUNDRED AND FORTY-SECOND LIST OF BOOKS.

The figures in round brackets refer to the figures after the names of the donors. The books to which no such figures are attached have either been bought from the Library Fund or received through the *Journal*.

Bastos, M.	*Tratado de Patologia Quirurgica General* ..	(3)	1932
British Pharmacopœia			1932
Campeanu, L. ..	*Tratamental Chirurgical al Tuberculozei Pulmonare*	(3)	
Clinical Interpretation of Aids to Diagnosis. Vol. 2			1931
Cope, J.	*Cancer: Civilization: Degeneration*		1932
Davis, R.	*Technique de l'osteosynthèse*	(3)	1932
Dietrich, A.	*Thrombose ihre Grundlagen und ihre Bedeutung*	(3)	1932

Douthwaite, A.H.	*Guide to General Practice*		1932
Drury, E. G. D. ..	*Choosing a Wife and Other Essays*		1932
Frühwald, V. ..	*Plastic Surgery of the Nose, Ear and Face* ..		1932
Halford, A. C. F...	*Lister Redivivus*	(3)	1928
International Register of Spas and Mineral Waters			1931
Little, E. M.	*History of the British Medical Association, 1832–1932*	(6)	1932
Lumière, A.	*La Vie, la Maladie et la Mort*	(4)	1928
Oliver, J. R.	*Pastoral Psychiatry and Mental Health* ..	(8)	1932
Problem of the Out-patient..		(1)	
Respice-Prospice, Lewis's, 1844–1931			1931
Salmon, W.	*The New London Dispensatory*	(5)	1676
Société Internationale de Chirurgie, IX Congrès, Madrid		(3)	1932
Sorrel, E., and Sorrel-Déjèrine, Y.	*Tuberculose osseuse et ostéo-articulaire*	(3)	1932
Stephanus, E. C. ..	*De dissectione partium corporis*	(2)	1545
Strümpell, A ..	*A Practice of Medicine.* By C. Seyfarth. Translated by C. F. Marshall & C. M. Ottley. 3 vols. 30th Ed.		1931

TRANSACTIONS, REPORTS, JOURNALS, ETC.

Anales de clinica de hospital Juarez. Tomo 1..		1931
Calendar of the Royal College of Surgeons of England, 1932..	(7)	1932
Medical Research Council. Special Report No. 167		1932
Medical Society's Transactions. Vol. LV.		1932
Quarterly Cumulative Index Medicus. Vol. 11..		1932
Saint Bartholomew's Hospital Reports. Vol. LXV...		1932
Saint Thomas Hospital Reports. Vol. LIV.		1932
Surgical Clinics of North America. August, 1932		1932

Local Medical Notes

EXAMINATION RESULTS.

University of Bristol.—Students of the University have recently passed the following examinations :—

M.D.—R. M. Norman, C. A. Joll.

M.B., CH.B.—*Supplementary First Examination. Pass :* E. M. Barber, Marjorie R. A. Batten, R. L. J. Derham, P. K. Jenkins, Margaret E. M. Slater.

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J.W. Arrowsmith
Publishers
Bristol

Vol. XLIX. No. 186. WINTER, 1932.

The Bristol Medico-Chirurgical Journal

PUBLISHED UNDER THE AUSPICES OF

THE BRISTOL MEDICO-CHIRURGICAL SOCIETY.

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